

FEBRUARY 1951

Route this to:

# CHEMICAL PROCESSING

*The News Magazine of Processing Developments and Control*

## *Highlights*

of this issue's  
243 articles

*Describing developments in  
processes, techniques, materials,  
equipment*

**Fiber Recovered from Waste  
Waters Pays for Treatment  
Plant in 2 Years . . . . . 10**

**Where Unusual Resistance to  
Extreme Corrosives is Needed,  
These Coats Appear to be a  
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**Adhesion, Flexibility, Resistance  
to Chemicals are Features  
of Four Coating Resins 26**

**Takes Merely 2½ Minutes to  
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of 0.1 percent . . . . 52**

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Only 4 Hours . . . . . 66**

**Concentrates Heat-sensitive  
Fluids; Can Evaporate 1/3 lb  
Water Per Min. . . . . 93**

## *The Cover Picture*

Heating wax melting  
kettles with electrically  
heated oil system avoids  
costly and comparatively  
heavy equipment, as well  
as maintenance required  
by former high-pressure  
steam system . . . . Page 8

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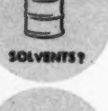
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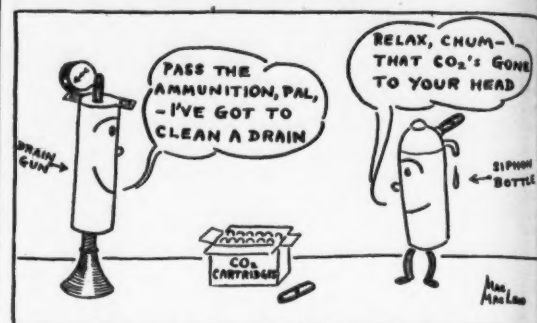
FINE CHEMICALS

"That's Interesting"

## "Gun" cleans clogged drains with CO<sub>2</sub> soda cartridge

Clogged or sluggish drains in sinks, basins, tubs and toilet pans are said to be cleared instantly with aid of a cylindrical instrument that uses standard soda CO<sub>2</sub> cartridges obtainable in drugstores.

Although only 19" long, the instrument resembles a bazooka more than anything else, and is called Drain Gun. A reversible suction cup at one end of the gun is placed over the drain, handles at the



other end are depressed, and 50 lbs of CO<sub>2</sub> are discharged into the drain. Action of the water, pushed by the CO<sub>2</sub>, does the trick. While the gun has pneumatic action, the effect is hydraulic. (Handling Devices Co., Inc., 581 Boylston St., Boston 16, Mass.)

## Industrial expansion for defense should start at basic chemical level to meet great demands

Current developments are showing that the large industrial expansion program now under way should have begun at the basic chemical level. This is emphasized by W. S. Richardson, president of B. F. Goodrich Chemical Co., in discussing what is said to be the greatest shortage of raw materials ever experienced by the chemical industry.

Recently reactivated, government-owned, industry-operated synthetic rubber plants are straining chemical supplies. If these and many other requirements are to be met, the chemical industry requires encouragement from government that will enable it to obtain a fair return on its invested capital, said Mr. Richardson. He further explained that to protect capital outlays it is vital to apply for a certificate of necessity from the government or increase prices to take care of increased costs. New facilities cost three times more today than did similar expansions during World War II.

Organizations building new plants must prove that their production will go into direct defense effort in order to obtain accelerated amortization. If accelerated depreciation is to be granted only to new plants producing war materials exclusively, serious crises lie ahead, said Mr. Richardson.

Goodrich Chemical Co. started a large expansion of its Gen. polyvinyl resin manufacturing facilities shortly after the Red attack on South Korea.

## 7,000 ton rubber pad forming press

A 7,000 ton rubber pad forming press is nearing completion at Hydraulic Press Mfg. Co., Mt. Gilead, Ohio. It will be used at Boeing's Seattle plant to form bulkheads and parts for bombers. The "Guerin" process eliminates blanking and forming bottlenecks.

## Stops corrosion by recirculated air conditioning water

Mixtures of the molybdates and tungstates of sodium and potassium are effective, in small amounts, in stopping corrosion of iron and steel by recirculated water in air conditioning plants, says the Chemical Digest, publication of Foster D. Snell Inc., New York 11, N. Y.

Available

An oxygen nail as nail to renovate applica design weigh transver

Cement any desi fire and greases. kalis. I teristics. test car volved

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blan

FEBR

## "That's Interesting"

### Available cement flooring

An oxychloride cement that is said to be as nailable as wood is now being used to renovate wooden box car floors. Its application does not involve change in design of car. Floor is flexible, lightweight, and has high compressive and transverse strength.

Cement is troweled on like concrete to any desired surface smoothness. Floor is fire and sparkproof, resistant to oils and greases, and fairly resistant to most alkalis. Heat and cold do not alter characteristics. After 2½ years of service in test cars, only maintenance required involved filling of nail holes and gouges.

In installing floor, saturated felt paper is first laid; then reinforcing wire is nailed over paper. Retaining strips are fastened over doorways of the car. Cement is troweled into the wire. Additional trowelings are given to the floor to obtain desired smoothness. The cement is a development of Westvaco Chemical Div., Food & Machinery Chemical Corp., Newark, Cal.; F. E. Schundler Co., Joliet, Ill. (who also distribute it); Dow Chemical Co., Midland, Mich., and The Weyerhaeuser Timber Co., Longview, Wash.

### First paraffin wax in U. S.

Eighty-five years ago, a man in Corry, Pa., hung a bulging canvas bag in a butcher's ice box. The bag contained crude oil from which some of the lighter portions had been boiled away. As the oil slowly drained through the canvas, it left behind a deposit of paraffin wax which had congealed in the low temperature. This was the earliest known U. S. production of wax from petroleum.

From its original use for candles, applications have extended into many industries. Some 30,000 tons are still used yearly for candle production while nearly 250,000 tons are required for coating paper or paperboard.

In contrast to early waxmaking methods is the array of equipment at Esso Standard Oil Company's Bayonne, New Jersey, refinery, which uses a solvent to separate oil and wax. (Reprinted from The Lamp, Standard Oil Company (N. J.).)

### Made in 900 shades

Porcelain enamel differs from paint enamels and baked synthetic enamels in that porcelain enamel is composed entirely of inorganic substances, including silica, fluor spar, zirconium, titanium, and other minerals which are virtually indestructible in ordinary use. Actually a form of glass, porcelain enamel is fused with the base metal at extremely high temperatures, forming an inseparable bond. Porcelain enamel is produced in over 900 shades, and electric spectrometers are used to assure perfect matching of colors by comparing spectrum readings undetectable to the human eye. (Porcelain Enamel Institute, Washington 5, D. C.)

(Continued on third cover)

For more information on product at right, specify CP 2894 . . . see information request blank between pages 2-3.

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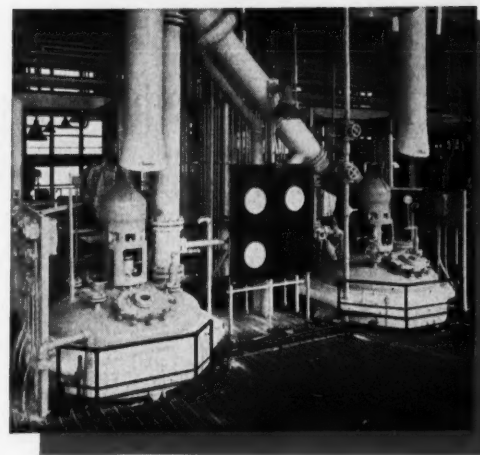
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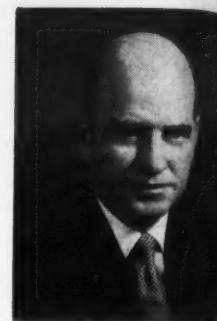
## STAINLESS STEEL TUBING

When inquiring check CP 2895 on handy form, pgs. 2-3

### Research Can Be Unprofitable!

By  
**DR. CHARLES ALLEN THOMAS**  
 Executive Vice President of Monsanto  
 Chemical Company

Graduate from Transylvania College and M.I.T., with degrees of B.A., M.S., and D.Sc. Holds degree of LL.D. Joined General Motors Research Corp. as research chemist in 1923, later transferring to Ethyl Gasoline Corp. In 1926, organized Thomas & Hochwalt Laboratories at Dayton, O., which Monsanto acquired in 1936. Acted as central research director, and in 1942, director of the company.



One of the principal scientists in the development of the atom bomb in World War II, he was Monsanto's project director for operations at Clinton Laboratories at Oak Ridge, Tenn. Received Model for Merit from Sec. of War in 1946. Was one of the 50 authors of A Report on the International Control of Atomic Energy. Author of numerous scientific papers, holder of many honors, and member of various national professional and civic groups.

Industrial research is certainly in its "Golden Age" at the present time. It continues to grow year by year, and even the general public is becoming more and more informed as to what research means to them in terms of new, better and lower-cost products. Emphasis has been on how important research is to a company... how it can increase its profits and competitive standing. With proper administration and cooperation between sections or departments of a company, research will do all of this. But unfortunately, research can be unprofitable under certain circumstances.

For instance, top management may apply extreme pressure for the solution of a technical problem. It may insist on a lot of action at once. As a result, the research administrator is likely to marshal a lot of men and get them busy. Because of the pressure, the project may be pushed ahead into the pilot plant, or even full-scale production, on the basis of results that would be considered preliminary and incomplete under calmer circumstances. It is not uncommon that the project has to be returned to research because the pilot plant or full-scale plant does not operate as anticipated. This of course leads to costly changes, reconstruction and wasted time.

The general tendency is to be too superficial in the laboratory phases of a project, despite the fact that the laboratory stage usually consumes the least money of any of the principal steps in the project's development. A typical project is likely to show a cost distribution pattern in which the laboratory research represents not more than a few percent of the total expenditure for bringing the project successfully from the idea state to commercial status. If an honest appraisal is made, we are quite likely to find that we have spent far more than all the laboratory work cost just to compensate for lack of information needed for a good design job, and for construction costs which would have been avoided if a more thorough laboratory job had been done in the first place.

From time to time there are research tragedies that would not have occurred if research were administered realistically. For example, assume that a company has developed a plasticizer, worked out processes, and prepared a number of samples for evaluation. Then, after all that time and effort, it is found that the plasticizer does not provide the final properties to the plastics that the company thought

(Continued on page 57)

CHEMICAL PROCESSING

# CHEMICAL PROCESSING

(CHEMICAL PROCESSING PREVIEW)

The News Magazine of Processing  
Developments and Control

OL. 14

FEBRUARY, 1951

No. 2

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737 N. Michigan Ave., Chicago 11, Illinois  
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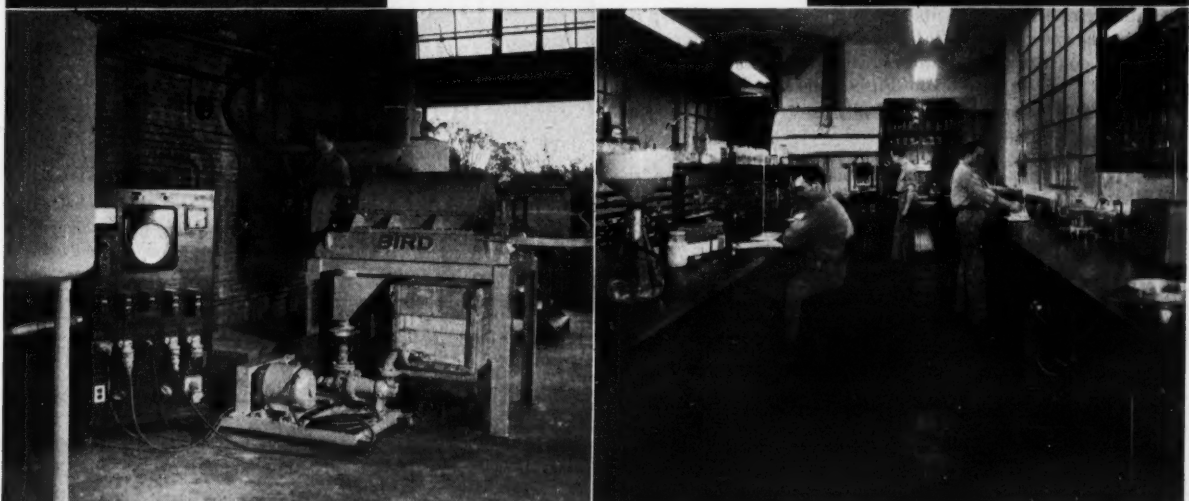


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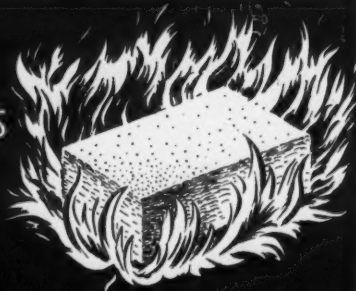
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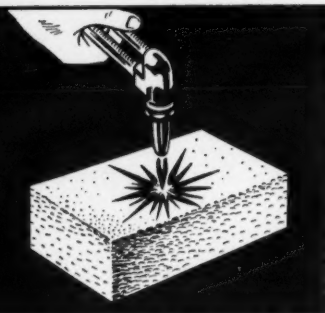
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## HIGHLIGHTS

(continued from front cover)

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FEBRUARY, 1951



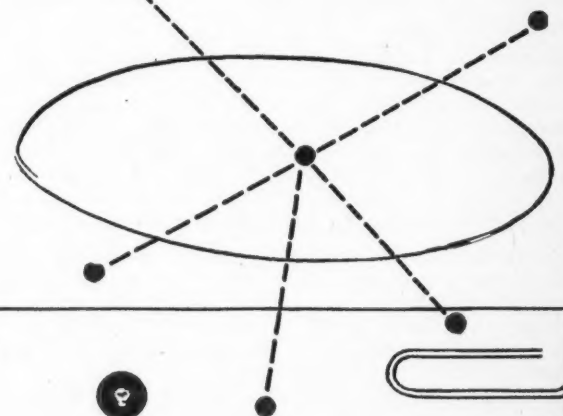
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When inquiring check CP 2898 on handy form, pgs. 2-3

# Tray-drying of Chrome Yellows Took 24-36 Hr; Continuous Dryer Does Job in 1 Hr.

**PROBLEM:** The Sherwin-Williams Company, Chicago, Ill., used to filter their chrome yellow colors in filter presses and tray-dry them. It was necessary to dry them 24 to 36 hours by this method, depending upon the type of color being processed.

The company changed their process to a semi-continuous one, in which filter presses are not used. Actually, two production lines are used. Filtering is accomplished by a continuous rotary vacuum filter in one, and by a continuous centrifugal filter in the other. More details on the centrifugal filter in this application have been published (CHEMICAL PROCESSING, October 1950, page 8).

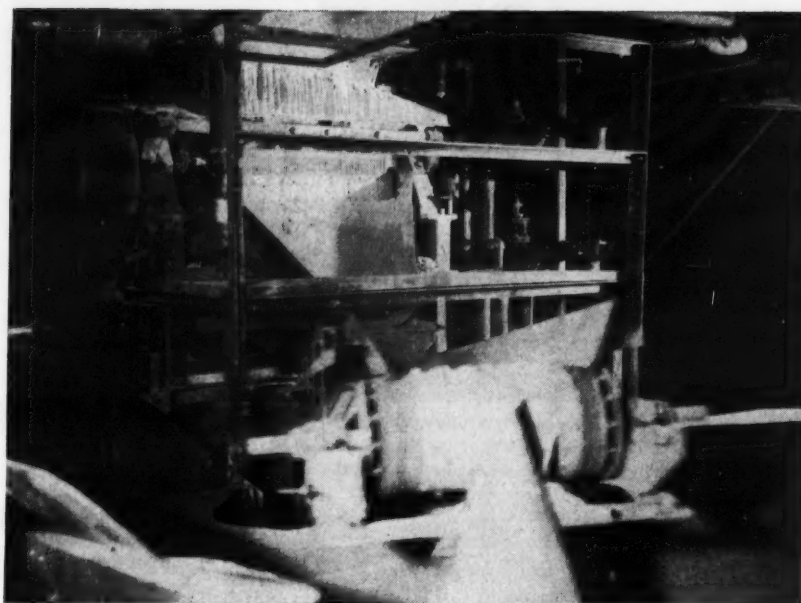
When continuous filtration had been decided upon, the company attacked the next problem — a better, faster method of drying.

**Solution:** A continuous dryer of the moving belt type is employed on the colors after filtration in each production line. Thick slurry from the filter falls down through a hopper from the filter on the floor above and is preformed into sticks by a heated fin-drum device. The sticks are fed to the perforated stainless steel belt of the dryer. Hot air blows down through the material as it slowly moves through the dryer, accomplishing the drying.

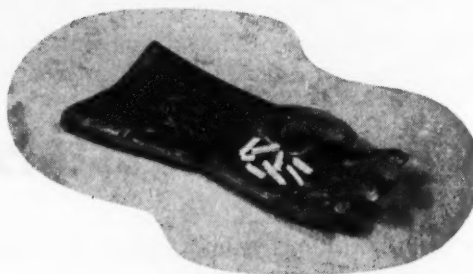
The mechanically dewatered product is fed into the hopper of the fin drum preforming feed. The top, smooth-surfaced steam-heated roll, set close to the concentrically grooved main fin drum roll, presses the wet product into the grooves of the fin drum. Two supplementary, smaller diameter, smooth-surfaced steam-heated rolls iron the product and assist with its retention in the grooves of the fin drum.

As the drum revolves, more moisture is driven off and the product becomes dry enough to hold a definite shape. In the front of the unit, scrapers remove the material from the grooves of the drum in the form of little sticks. The fin-drum has 1-4 speed variation, and the steam pressure can be varied to produce different surface temperatures.

The sticks fall to an inclined chute which carries them to a device that feeds an even bed on the belt of the dryer.



Fin-drum device (top background) preforms pigment into sticks which are delivered to slowly moving dryer belt by oscillating feeder (Not shown)



Sticks leaving preforming device look like this

This device consists essentially of a moving belt that is mounted on a fulcrum so that it extends over the dryer belt. The feeder belt oscillates over the full width of the dryer belt, about 7 feet, depositing the sticks on the dryer belt in an even layer.

The feeder at Sherwin-Williams is a mechanical type. Recently, a hydraulic type has been announced. The last type provides better control of speed and travel of oscillation, and smoother reversal. Both types are, of

## New Solutions OF PROCESSING PROBLEMS

**Materials are preformed into sticks and distributed on dryer belt in even layer by oscillating feed device**



Inverted funnel at end of feeder belt aids in distributing pigment sticks on belt of dryer

course, adjustable in speed. (The hydraulic model is described on page 131 of the October, 1950, issue of this publication).

**Results:** Drying is accomplished in about one hour. Both lines combined have an average production rate of 1500 lb/hr. Because of the stick form of the dried colors, they are readily carried in a zipper-type conveyor from drying to grinding. As was emphasized in the previous article on this process in October CHEMICAL PROCESSING, the product is of improved quality, and recovery is higher due to the continuous, enclosed process through filtration, drying, and grinding.

Having "preformed" the material into small shapes and distributed these small shapes in an even bed on the moving conveyor — more rapid diffusion takes place and the drying time is drastically reduced.

**Source:** Dryers, feeders and preformers employed in this installation are developments of Proctor & Schwartz, Inc., Dept. CP, 7th St. & Tabor Rd., Philadelphia 20, Pa. . . or for more information check CP 2899 on handy form, pages 2 and 3.

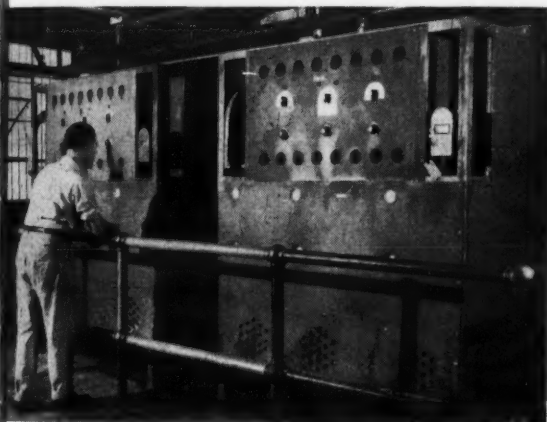
CHEMICAL PROCESSING

## New Plant Uses Oil Heat Transfer System for Melting Household Wax

**Flexible, low-pressure installation provides accurate control of temperature; maintenance is at minimum**

**PROBLEM:** Early in 1950, Boyle-Midway, Inc., a division of American Home Products Corporation, moved from a plant in Jersey City to a new one-story plant in Cranford, N. J. In the former plant, high-pressure steam was employed for heating kettles in the household wax melting process. As this type of heating involves expensive equipment, a fireman, and regular maintenance of piping and valves for leak prevention, the company sought another heating method.

**Solution:** The new plant has two oil heat transfer units that work in tandem to heat the six melting kettles located on a mezzanine floor directly above. Each kettle has a 1500-lb wax capacity, and the melting temperature is maintained near 250°F. The heaters circulate electrically heated oil by means of positive displacement



Two oil heater units provide controlled heat for kettles

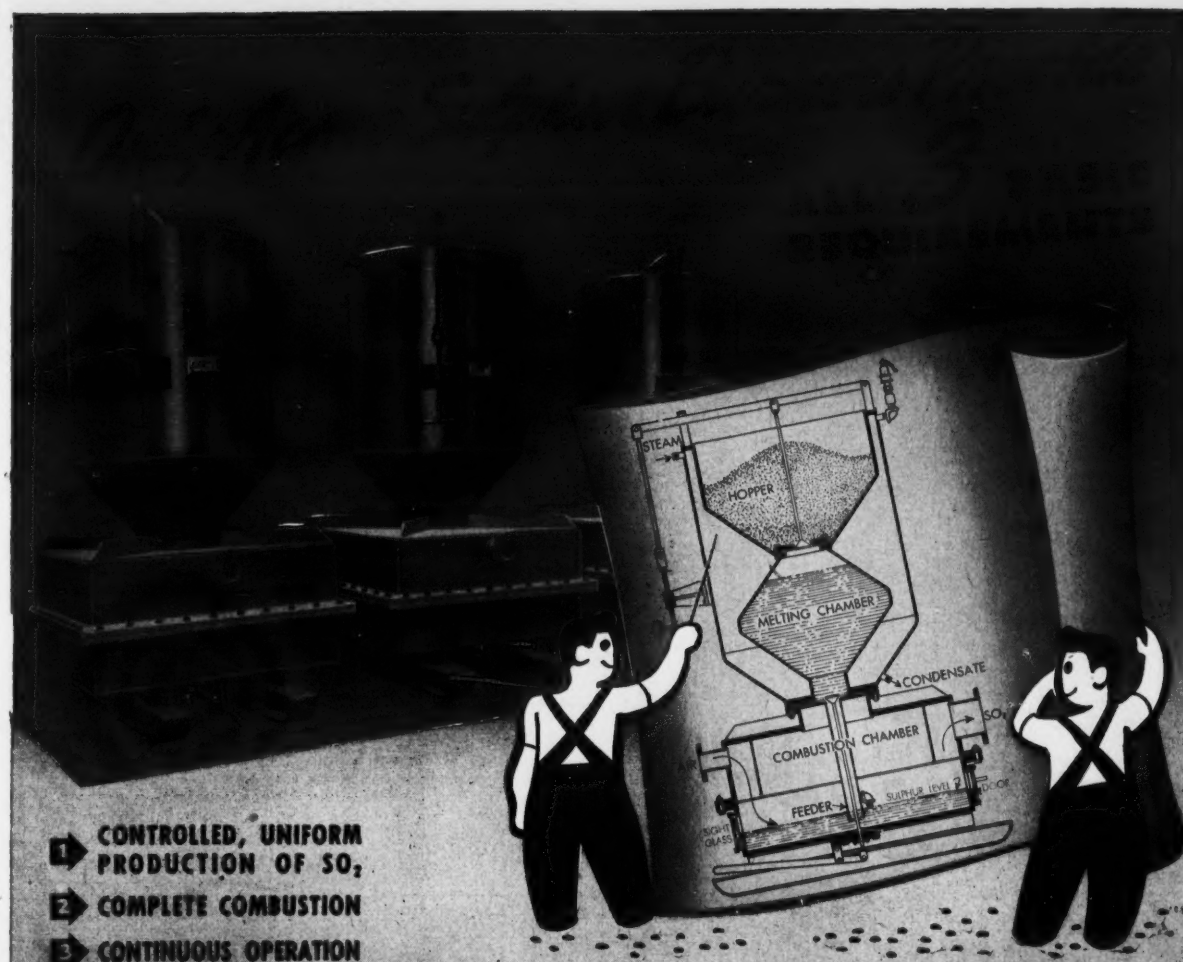
pumps from a compact, self-contained cabinet through the jacketed piping surrounding the kettles.

Each of the two units has three oil circulating circuits and operates at a maximum load of 65 kw. Each has a master time clock device that starts and stops the heat transfer system at predetermined intervals. On each kettle there is a separate time clock regulator. Thermostatic control can be used instead, if preferred.

Connected in series, the oil heater units are arranged for maximum flexibility. The full heat output of 440,000 Btu per hour can be channeled to one or two kettles for quick melting, or the heat can be distributed among all 6.

**Results:** The system can supply heat up to 550°F where necessary, at negligible vapor pressure, and can be used with inexpensive distribution equipment of comparatively light construction. Accurate control of temperature is obtained, and maintenance is at minimum.

**Source:** Oil heat transfer units were made and installed by engineers of Walter Kidde & Co., Youngstown-Miller Division, Dept. CP, 40 E. 34th St., New York 16, N. Y. . . . or for more information check CP 2900 on handy form, pages 2 and 3.



- 1 CONTROLLED, UNIFORM PRODUCTION OF  $SO_2$
- 2 COMPLETE COMBUSTION
- 3 CONTINUOUS OPERATION

An ordinary sulphur burner, which burns solid sulphur on a tray or rotating cylindrical surface, cannot provide a definite, constant burning rate. Since ordinary sulphur contains a small percentage of organic matter, this matter accumulates on a carbonaceous crust on the surface of the burning sulphur, and gradually extinguishes the fire. In order to overcome this factor the Acme Sulphur Burner is operated at a controlled rate sufficient to burn off this crust. Also, in an ordinary burner, the addition of a fresh charge of sulphur to the burning surface disrupts the burning rate for several hours. The Acme Sulphur Burner has a special feeding device that feeds melted sulphur to the burner in a manner that does not disturb the burning surface, at the same time maintaining a constant level of burning sulphur. Thus, uniform production, complete combustion, and continuous operation result.

The Acme Sulphur Burner will operate equally well under pressure or vacuum, and the manufactured gas can be discharged directly to the absorbing apparatus. Efficient operation under either low-grade pressure or vacuum operation, when required for large scale production, automatic operating controls, can be furnished.

### —OPERATING PROCEDURE—

Solid sulphur is charged into the hopper of the melting chamber, around which live steam is introduced at about 25 pounds gauge pressure (if steam is not available, an electric heating element is supplied). The melted sulphur is fed to the combustion chamber by means of the feeder, which automatically maintains the correct level. Compressed air, or air furnished by a blower, is used for combustion. The quantity of air supplied regulates the concentration of  $SO_2$  produced.

Since the introduction of the feed is below the surface, the burning area is never disturbed. This, together with the unchanging level of molten burning surface, and a controlled air supply, guarantees a constant burning rate and thereby a uniform production of  $SO_2$ .



*Processing Equipment*

When inquiring check CP 2901 on handy form, pgs. 2-3

## Fiber Recovered from Waste Waters Pays for Treatment Plant in 2 Years

**Asphalt board mill finds that 85% of the water and almost all of the fiber can be recirculated to production**

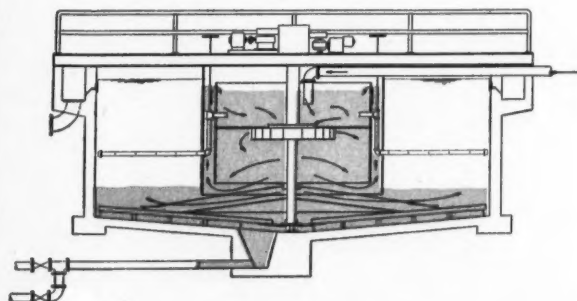
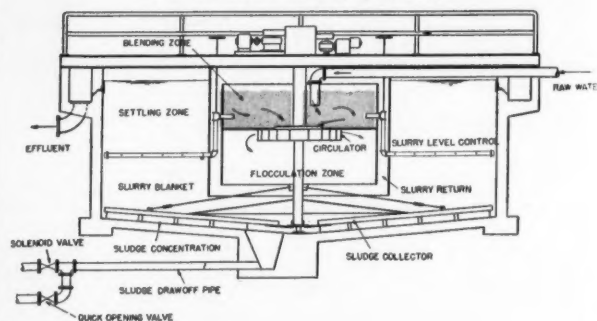
**PROBLEM:** Waste waters from a Michigan paper company producing asphalt board were all discharged into a river that went through the center of town. The waters contained about 20 lb of suspended solids per 1000 gal, and had a black color approximating 6000 ppm, far above the regulations enforced by Federal, State and City governments. The State set up a specification requiring the waste discharge to have not more than 0.25 lb of suspended solids per 1000 gal, and 125 ppm color.

**Solution:** The company installed a waste treatment

plant consisting of 1) a rapid-mix (Homomix) unit where chemicals are mixed with the raw waste, followed by 2) a 2-stage propeller type flocculation unit, and finally 3) a down-flow circular sedimentation tank (Flocc settler) which is equipped with sludge removal mechanism and surface effluent troughs or launders.

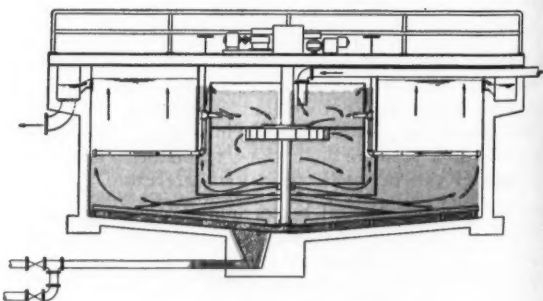
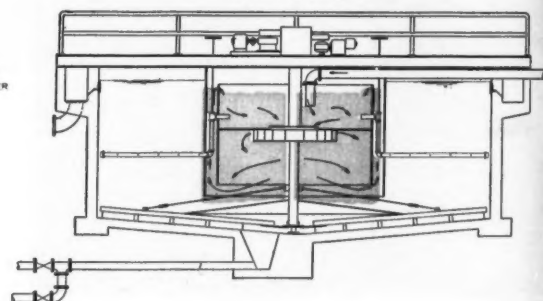
All waste water is collected by a sewer system that empties

**Figure 1—Mixing and blending—**Energy provided by entrance of influent is utilized to cause complete blending of chemicals and slurry with water. Uniform blending of slurry causes utilization of sludge particles for the formation of new precipitates



**Figure 3—Slurry recirculation and slurry blanket—**The differential in pressure which exists between the mixing zone and flocculation zone produces a positive return flow of slurry through the annular section surrounding the two zones. Slurry return rates of several times the inflow can be accomplished by means of the variable speed circulator. Segregation of sludge particles in the settling zone forms a sludge blanket that filters the flow and enmeshes the finer particles

**Figure 2—Flocculation and softening—**Influent is further blended when it passes through the slow-speed circulator into the flocculation or softening zone. Flocculent particles build up from the nuclei of returned slurry. By maintaining a system of well-flocculated precipitates in a concentration which is optimum for the particular treatment, it is possible to form a slurry or sludge of the type which readily settles when it reaches the quiescent settling zone



**Figure 4—Settling and sludge concentration—**Note that total flow entering the settling zone is exactly equal to the inflow. As all recirculation is withdrawn outside of the settling zone, there is no increased disturbance in the quiescent area. Upper surface of the sludge blanket can be controlled by allowing recirculation lines from this area to discharge back into the blending zone. Sludge is concentrated by the squeezing action of the scrapers moving in an isolated concentration zone. The isolating baffle is an integral part of collector structure

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into a wet well from which the water is pumped into the treatment process. A coagulant dosage of approximately 200 ppm of aluminum sulfate is added at the Homomix. After passing through this instantaneous mixing unit, the mixture is held for about 15 minutes in the flocculation tank where the small fibers and chemical precipitates agglomerate. Adsorption of the asphalt and carbon particles is accomplished during this period.

After flocculation, the waste passes to the Flocsetter. Principle of this unit's operation is illustrated in the series of drawings, Figures 1, 2, 3 and 4. At this plant, the rise rate in the sedimentation zone of the Flocsetter was designed at 1.0 gpm per sq ft. Sludge is scraped by circular mechanism to a sludge hopper containing a spiral cross collector which concentrates and conveys the sludge to the outlet pipe leading to the suction of a sludge pump. Fiber is returned to production.

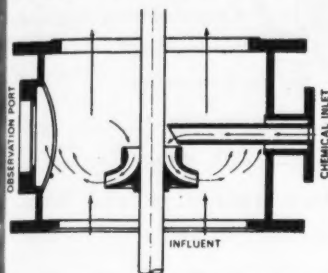


Figure 5—Sectional view of Homomix unit reveals principle of operation

The Homomix unit mentioned above is constructed of one or more mixing stages and forms part of the influent piping. Each stage (see Figure

5) consists of a diffusing impeller rotating in a blending chamber, and driven by a continuous shaft. Introduction of chemicals to each chamber is made through a tube specially adapted for handling the applied solution. The solution, entering at the eye of the impeller, is carried by the vanes, accelerated to a high velocity, and thrown out by centrifugal force into the annular channel. The simultaneous circulation of a small portion of the raw liquid with the injected chemical solution provides the volumes necessary to obtain optimum dispersion.

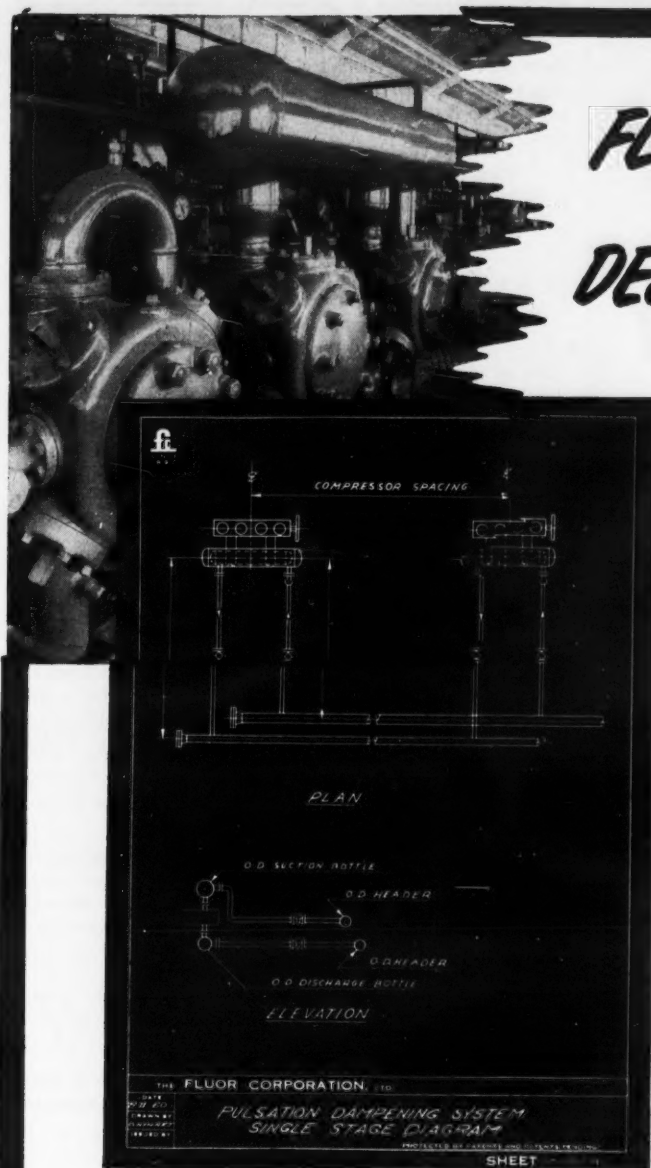
**Results:** Although the original design contemplated discharge of the treated effluent to the river, the degree of purification was so high that it was possible to recirculate most of the water back into the production processes. About 85% of the effluent water is being re-used. This has meant a considerable saving in raw water, its pumping, and maintenance of the pumping system.

In addition, the sludge from the sedimentation tank which contains the fine fibers is returned to the dirty water make-up tank where it is distributed into the broke chests of the board machines. Thus, all fiber is reclaimed, except for a very small amount that escapes in the effluent sent to the river.

With a typical flow of 755 gpm, containing 19.65 lb solids per 1000 gal, 21,359 lb of dry solids per day were lost to the river before the treatment plant was installed. Now, 21,239 lb per day are recovered, or all but 120 lb. When the value of the reclaimed fiber was estimated, it was found that the entire treatment plant would pay for itself in about two years.

As a result of the effective waste treatment program, the State officials made the following comment: "Your company is to be commended on its accomplishment. . . At the present time we know of no paper mill in the area that is equalling the treatment performance that is provided here."

**Source:** This treating equipment is a development of The American Well Works, Dept. CP, Aurora, Ill. . . . or for more information check CP 2903 on handy form, pages 2 and 3.



## FLUOR PIPING SYSTEMS ARE DESIGNED FOR PULSE-FREE PERFORMANCE

The Fluor Pulsation Dampening Piping System is the newest and most practical approach to pulse-free piping yet developed. Furnished in prefabricated form, ready for installation, this modern piping system attenuates objectionable pulse peak pressures caused by the reciprocating action of compressors. The operator is assured of trouble-free piping throughout the life of his plant or station—at an initial cost comparable to conventional compressor piping systems!

Design of the system is such that conventional volume bottles, laterals and headers are utilized to provide the appropriate components of an acoustical filter—the basic principle of the long-proven Fluor Pulsation Dampener. By choice of line size and arrangement, Fluor's pulsation dampening principle is incorporated as an integral part of initial compressor piping design. This involves no radical departure from the physical appearance of conventional piping systems, except for a reduction in the number of extraneous devices usually required to anchor piping.

Fluor Pulsation Dampening Piping Systems are guaranteed to provide a steady, smooth gas flow with minimum pressure drop. Because of this steady flow, many advantages are realized by the operator. Safety is increased by eliminating vibrational stress on piping, heat exchanger and vessels. Compressor operating efficiency is increased, metering inaccuracies caused by pulsative flow are reduced, and maintenance problems common to conventional piping systems are cut to a minimum.

### COMPARABLE IN INITIAL COST...

Fluor Pulsation Dampening Piping Systems are designed primarily for new construction. Furnished in prefabricated form, the system is comparable in first costs with conventional piping systems. More important, though, are the savings possible in being able to design and specify related equipment based on a system free of pulsative flow and its attendant problems.

Include the Fluor Pulsation Dampening Piping System in your thinking when contemplating new construction. Fluor Engineers are available to explain in full the advantages of this modern piping system—from the design stage on through the life of your plant!

# FLUOR

BE SURE WITH FLUOR

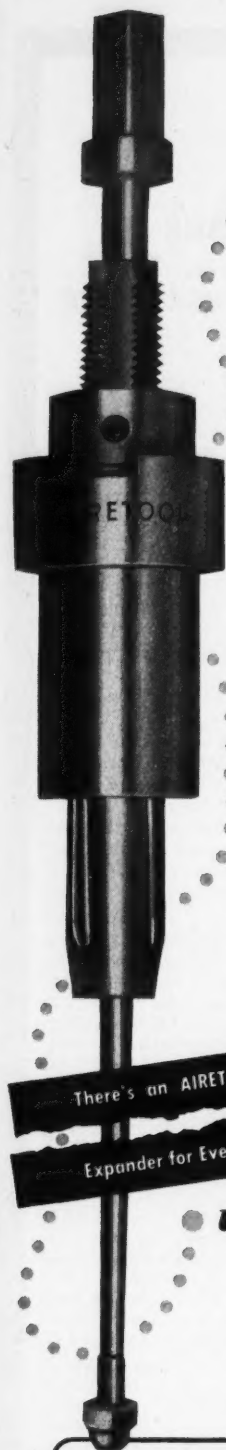
A 4-page Bulletin giving detailed information on this "pulse-free" piping system is available upon request.

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When inquiring check CP 2904 on handy form, pgs. 2-3



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FAST  
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tube expanders**

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Expander for Every Type of Tubular Construction

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## NEW SOLUTIONS of processing problems

**Petroleum coke yield up 63.5%  
since adding carbon to  
oil fed to oven...**

colloidal charge lops hours from time required to clean tubes of economizer and furnace

**Problem:** Petroleum coke, tar, high Btu gas, and aromatic products are produced from cracked heavy fuel oil in a Knowles type oven at Portland Gas & Coke Company, Portland, Oregon. The thermal capacity of the installation was limited in its ability to crack the distillate materials to gas and aromatic light oils. However, the oven floors appeared to have adequate thermal capacity for considerably increased amounts of coke. The aluminum industry of the Pacific Northwest provides a stable market for coke.

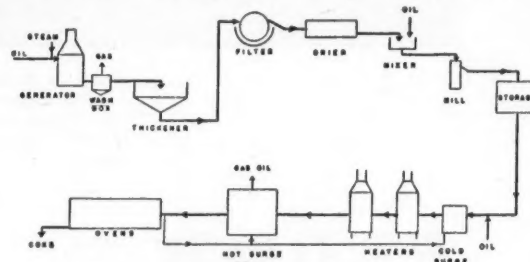
The company's main concern was to devise a process that would utilize the full thermal capacity of the oven floors, in order to increase coke yield as high as possible with the existing equipment.

**Solution:** Feed stock for the ovens is residuum oil of approximately 8° API gravity which is further reduced by topping before it is charged to the oven floors. The flash-topping increases the coking value to some extent and provides a preheated charge stock. Oil-gas carbon, produced in the company's oil-gas process checkerbrick generators, is mixed with the oil feed stock by a procedure which has become standard with the company.

This carbon has an ultimate particle size of 0.2 to 2.0 microns, average diameter being 0.6 micron. During recovery from the gas stream and subsequent drying, agglomeration takes place.

The carbon, containing 10-12% water, is batch-mixed with some oil, and the mixture is ground to a maximum particle size of 120 microns in a Speedline SB-1400 paint type mill which has a capacity of about 35 tons of carbon per day (about 800 gal per hour). The degree of grinding is very important. Fine grinds tend to increase the viscosity considerably, and coarse grinds cause the difficulty of sedimentation in storage or plugging of valves and other equipment.

From the mill, the oil-carbon mixture goes to a surge tank and then through a flash evaporator for dehydra-



Flow diagram of process for making petroleum coke from a colloidal fuel feed

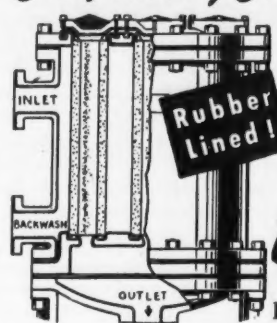
prior to storage. The last two pieces of equipment are not indicated on the flow diagram.

The mixture enters the coke oven feed system at the cold surge drum, which is ahead of the feed heater, and is therefore subjected to the same flash-topping as the balance of the feed. The oven-loop piping system, provided to deliver feed to the floors, aids in keeping the carbon in suspension because the stream is virtually always in constant motion.

**Results:** The accompanying table shows that the yield of coke has been increased 63.5% without seriously

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PORO-STONE  
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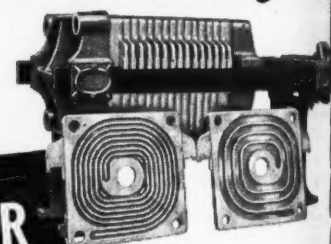
3 Filter shells — rubber or lead lined. Filter tubes inert to acids or alkalis.

Write for Bulletin 9348

**R. P. ADAMS CO., Inc.** 243 E. PARK DRIVE, BUFFALO 17, N. Y.

When inquiring check CP 2906 on handy form, pgs. 2-

**When It Settles Slowly  
and You  
Have to  
Wash It**



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**SHRIVER  
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THICKENER**

for  
• Slow settling solids requiring washing.  
• Reducing slurry to required degree of thickness.

A modification of the filter press, the Shriver Thickener is designed so that filter cake is not built up in the chambers, but the slurry is swept out in a continuous stream while it is being progressively thickened by the filtering action of the equipment. As a replacement for washing or thickening of many products by settling or decantation, this Thickener can reduce processing time as much as 90 per cent. Investigate—write for Bulletin 122.

**T. SHRIVER & COMPANY, Inc.**  
846 Hamilton St. Harrison, N. J.

When inquiring check CP 2907 on handy form, pgs. 2-

When inquiring check CP 2905 on handy form, pgs. 2-3

## NEW SOLUTIONS of processing problems

affecting the yield of other products. The coke is of fully satisfactory quality.

### COMPARISON OF OVEN PERFORMANCE USING NORMAL FEED AND "COLLOIDAL FUEL" FEED

	Normal Oil Feed	Colloi- dal Fuel Feed	% Change
High Blu Gas, MCF/M gal feed	54.7	55.8	+ 2.0
Coke, tons/M gal feed	0.63	1.03	+ 63.5
Tar, gal/gal feed	0.338	0.368	+ 8.9
Light Oil, gal/gal feed	.079	.073	- 7.6

An unexpected result was a big reduction in coke build-up within the tubes of the economizer and oil heating furnace. Formerly, tube cleaning required as much as 240 hours. Now, due to less build-up and softer deposits, only 50 to 60 hours are needed.

It appears that the oil-carbon mixture has good characteristics as a fuel. If the mixture is kept in motion, sedimentation doesn't pose much of a problem. The fuel has a high luminosity of flame, a factor of major importance in any operation which uses radiation as a means of transferring heat to a material in process.

Source: The Speedline mill is made by Morehouse Industries, Dept. CP, 1156 San Fernando Rd., Los Angeles 65, Calif. . . . or for more information check CP 2908 on handy form, pages 2 and 3.

### Natural air circulation cools hot detergent as it goes up on spiral conveyor . . .

"natural-frequency" vibration prevents attrition of granules, avoids dust nuisance

**Problem:** A large soap company employed a pneumatic system, incorporating direct compression, refrigeration and a 90 foot vertical rise, in cooling and conveying scalp-screened detergent granules. The granules were cooled from 180 to 80°F while they went through the system. It is obvious that such a method was quite costly.

In addition to the economic considerations, this method had the disadvantage of causing attrition of the granules, undesirable by company standards.

**Solution:** A spiral "natural-frequency" conveyor is now being employed by the company for conveying and cooling. Scalp-screen is on the lower spiral, actually a part of the conveyor unit itself. The material moves up the 35 foot conveyor due to the vibration caused by a 5 hp drive and coil springs. It cools by natural air circulation, created by the vibrating spiral itself, as it ascends. On the top few spirals, the detergent is sprayed with perfume. The photograph was not taken of this installation, but it shows the same type of conveyor being used in a different application. A few details of this installation are presented in "Results."

The conveyor can be enclosed by a jacket and used as a dryer, if desired. When used as such, it has the advantages of not requiring rotary joints (possible points of maintenance difficulties), and of having a high drying efficiency due to the "boiling" action of the material, which is equivalent to almost a continuous veil.

Conveyor does not create any dust nuisance, even with very fine material, except at the inlet and discharge points, and these may be covered. Wherever necessary,

(Continued next page)



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When inquiring check CP 2909 on handy form, pgs. 2-3

# New power play for FOULED TUBES

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MODEL TP-301

*even cleans plugged tubes  
...does regular jobs faster  
AT LESS COST*



After long research and field tests, Wilson now brings you the fastest, most economical straight tube cleaner on the market for refinery and process heat exchangers. The improved Model TP-301 is the only tube cleaner which can immediately remove deposits from completely plugged heat exchanger tubes. No matter how badly tubes are fouled, the Model TP-301 puts equipment back "on stream" with a minimum of manpower and a few hours work.

See the important advantages of this improved Model TP-301 Tube Cleaner in the diagram above and the panel at right. Send today for details, giving your specific requirements.

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### Additional New Features of Fast-Acting WILSON TUBE CLEANER

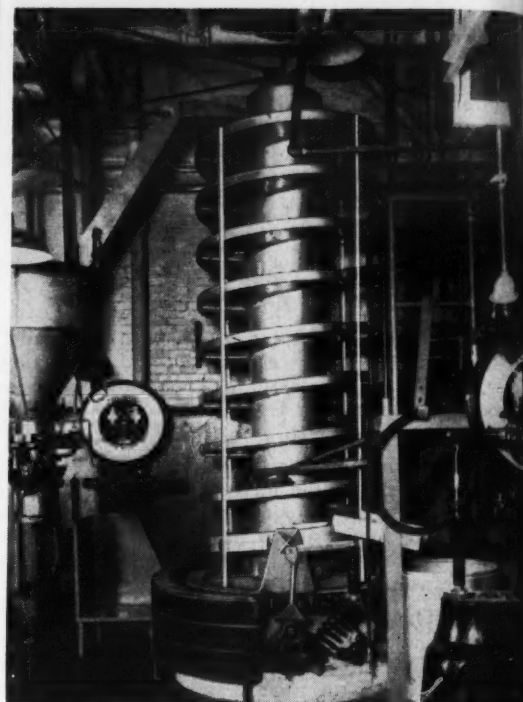
- More powerful
- Lighter weight — only 15 lb
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- Will operate on air pressure as low as 50 lb
- Costs less than previous models

# WILSON

WILSON TUBE CLEANERS • WILSON-DUDGEON TUBE-EXPANDERS

When inquiring check CP 2910 on handy form, pgs. 2-3

### NEW SOLUTIONS of processing problems



"Natural-frequency" spiral conveyor employed for carrying plastic cubes

the entire conveyor may be fitted with dust covers as an extra precaution.

By adding partitions, the operator can convey several different materials on one conveyor, discharging at different points, and/or mixing or blending at some point in the system.

**Results:** The pneumatic system, with its direct compression and refrigeration, is no longer necessary. The spiral conveyor requires less space than the pneumatic system. Self-cleaning action of the spiral is so gentle that no attrition takes place.

The installation shown in the photo is a 9 foot high spiral conveyor, carrying vinyl type plastic cubes vertically. The conveyor receives the cubes from an automatic cutting machine. The product is passed over a scalp-screen on the bottom spiral, oversize being discharged to drum in lower right-hand corner of the photo. The product then continues upward under a magnetic separator, final discharge being made into hopper of automatic weighing device. Material is discharged at 25 tons per hour. It goes up vertically at the rate of approximately 5 fpm. Conveyor drive is  $\frac{3}{4}$  hp.

**Source:** Conveyor is a development of Whitley Carrier Company, Incorporated, Dept. CP, 805 W. Main St., Louisville 2, Ky. . . or for more information check CP 2911 on handy form, pages 2 and 3.

**Ion exchange reduces acidity  
of formalin from 0.02%  
to less than 0.009% . . .**

anionic resin removes formic acid so it won't affect plastics manufacture adversely

**Problem:** Customers of a plant manufacturing formaldehyde by oxidation of methanol demanded

CHEMICAL PROCESSING

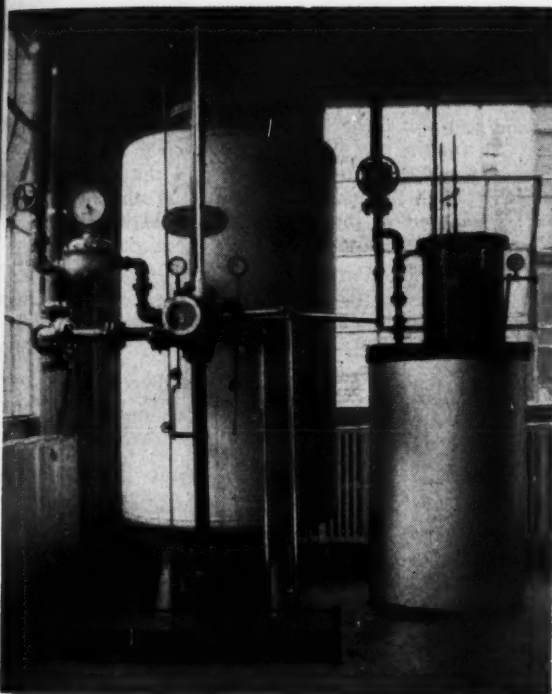
## NEW SOLUTIONS of processing problems

formaldehyde solution having a low formic acid content. These customers were largely plastics manufacturers, and the 0.02% formic acid present lowered the pH of the formaldehyde solution, interfering with their plastics manufacturing processes.

**Solution:** Formaldehyde solution is passed through an anion exchange bed of Permutit CCG. This removes virtually all of the formic acid. After the resin bed has been exhausted, it is regenerated with sodium carbonate solution (sodium hydroxide may be used instead). After rinsing out the excess alkali, the bed is ready for treating more formaldehyde. Permutit CCG has excellent stability, long life and good capacity on formaldehyde solutions.

### Performance of Permutit CCG

Capacity depends on 1) formic acid content going in, and amount of removal desired; 2) flow rate of formalin; and 3) regenerant dosage. Assuming that re-



Anion exchange unit, showing alkali regenerant tank at extreme left. Single control valve is used in regeneration

generant dosage is 3.5-4 lb  $\text{Na}_2\text{CO}_3$  per cu ft resin and that flow rate of formalin is about 1.5 gpm per sq ft of bed area, the capacity is between 1.5 and 1.8 lb formic acid per cu ft of Permutit CCG.

This capacity is based on reducing the formic acid from 0.15% to 0.03% in the composite effluent. For the major portion of the run, the formic acid content will be less than 0.007%. For reducing formic acid from 0.02% to 0.009%, the capacity is greater than 0.8 lb per cu ft.

**Results:** The ion exchange process reduces formic acid from 0.02% to less than 0.009%. Operating cost is 0.031 mils per pound of formaldehyde for regenerant and less than 0.038 mils for resin replacement.

**Source:** The Permutit Company, Dept. CP, 330 W. 42nd St., New York 18, N. Y. . . . or for more information check CP 2912 on handy form, pages 2 and 3.

FEBRUARY, 1951



ERIEZ MANUFACTURING CO., ERIE, PA., U.S.A. • PRODUCERS OF MAGNETIC SEPARATORS AND SELLERS OF R.C.A. ELECTRONIC METAL DETECTORS



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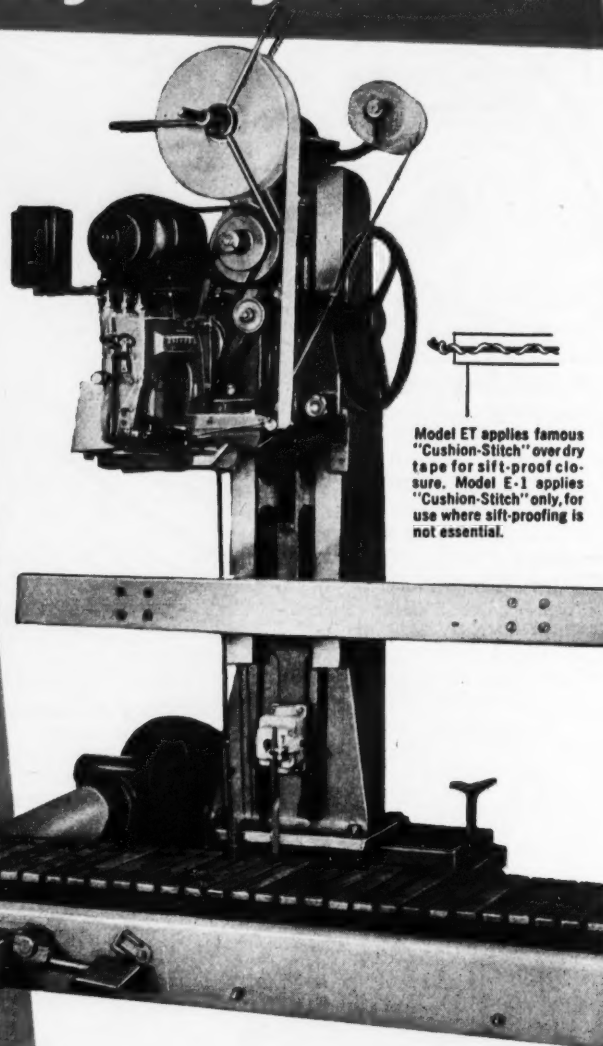
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When inquiring check CP 2913 on handy form, pgs. 2-3

In the year 1950 Bagpak, makers of Bagpak® Multiwall Paper Bags, introduced the NEW MODEL ET BAG CLOSING MACHINE. Many improvements which are important to manufacturers and packagers of a wide variety of materials are now available — improvements like the Bagpak new-thru "Dry Tape" closure for better protection at lower cost.

Another Bagpak Machine, the Model E-1, applies the famous "Cushion Stitch" without the "Dry Tape", and offers all the advantages of the other machine — speed, long life, easy and trouble-free operation.

A request on your letterhead will bring full information. No obligation is involved. If you haven't investigated the NEW BAGPAKERS®, be sure to do so now. Write today.



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When inquiring check CP 2914 on handy form, pgs. 2-3

**NBS finds ways to increase accuracy of oxygen analysis on gas samples . . .**

most important is to keep pyrogallol reagent cold and closed to atmosphere while making it up

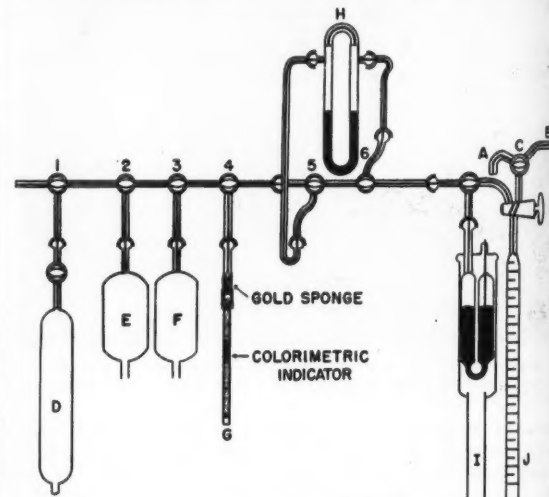
**Problem:** In gas analysis, the analytical absorption of oxygen by alkaline pyrogallol has been inaccurate because carbon monoxide is formed in unpredictable quantities.

**Solution:** The National Bureau of Standards investigated means of reducing the carbon monoxide formation to a negligible figure. First step was the selection of a suitable method for measuring the amount of CO formed in any one reaction. Knowing this, the conditions causing the production of the CO were found and corrected.

For this purpose, the NBS carbon monoxide indicator, developed during World War II, proved particularly suitable. The indicator, a yellow chemical that turns green on exposure to CO, can be compared with known standards to give quantitative readings. It is most accurate for concentrations of CO up to 0.1%. Higher concentrations can be determined by diluting the sample.

A modification of the Shepherd gas analysis apparatus was used for the test reactions. Oxygen in known mixtures was absorbed in pyrogallol, and the residue was passed through the indicator. Here, the amount of CO was determined so that corrections could be made for it in the final computations.

The accompanying drawing represents the equipment used in measuring the errors which ordinarily accompany the oxygen analysis. The numbers indicate ground-



NBS employed this apparatus in determining the amount of carbon monoxide given off while analyzing for oxygen content of a gas sample

glass stop-cocks. A sample of known oxygen content is introduced through the buret (J), measured, and swept through to the pipet (D), where the oxygen is absorbed. The residue then flows back to the buret to be measured. Rate of flow can be measured at (H). Samples high in CO are diluted in (E) and (F) before passing through the NBS indicator (G), where the amount of CO is determined colorimetrically. The gold sponge removes mercury vapor which affects the indicator.

**Results:** The greatest source of error was found to

## CHEMICAL PROCESSING

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Other people can be used to produce oxygen with a pipette and bubbles in a solution sample never last. maintain temperature sorption. If high temperature should after 12 absorbance. Source: *Science*, U.S. Washington

### Diagram of release

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## NEW SOLUTIONS

be the method of preparing the pyrogallol solution. Heat produced by the reaction, if not carried away immediately, resulted in the formation of CO in unpredictable amounts. The most satisfactory method of preparing the solution is to add a saturated solution of potassium hydroxide to pyrogallol crystals while the reaction vessel is immersed in ice water and closed to the atmosphere. NBS has found that samples having partial pressures of oxygen higher than 50% can be analyzed with the improved solutions without dilution of the sample.

Other procedures that NBS found to be useful in improving accuracy, reproducibility and rapidity of the oxygen determination are: 1) use of a pipet that disperses the gas in fine bubbles through at least 18 cm of solution; 2) a rapid rate of flow of the sample into the pyrogallol, certainly never less than 20 ml per minute; 3) maintaining the pyrogallol reagent at temperatures below 30°C during absorption.

If high accuracy is desired, the solution should not be used for analysis after 12 volumes of oxygen have been absorbed per volume of solution.

Source: National Bureau of Standards, U.S. Department of Commerce, Washington 25, D. C.

### Diagrams show details of relay operation

Fully-illustrated catalog describes mercury plunger relays. Complete specifications cover normally-open and normally-closed tubes and relays with various mountings; diagrams and cut-away drawings show how these relays work.

Catalog 17 is issued by H-B Instrument Company, Dept. CP, 2633 Trenton Ave., Philadelphia 25, Pa. When inquiring specify CP 2915 on handy form, pages 2 and 3.

### Uses for refrigerators include processing

Four-page bulletin specifies and illustrates line of refrigerators having applications in processing, testing, and storing. Units provide temps to -150°F. Bulletin T-1150 is issued by Bowser Inc., Refrigeration Div., Dept. CP, Terryville, Conn. When inquiring check CP 2916 on handy form, pages 2 and 3.

For more information on product at right, specify CP 2917  
... see information request blank between pages 2-3.



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**INSUL-MASTIC protective coatings**

**Keeping tanks and metal structures from corroding when they are located in the middle of an acid plant, is a tremendous job. But here at the American Cyanamid Company's Calco Chemical Division Bound Brook Plant, Insul-Mastic protective coatings are constantly keeping fumes, sprays and spillages from reaching the metal equipment. The acids just don't get a chance to start their corrosive action.**

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**Mastic's protection is good for a great many years.**

**Quality is the reason for this performance. And quality is the reason that Gilsonite Insul-Mastic is used in so many industries where corrosion problems exist—no matter how severe or how ordinary.**

**We would like you to have the name of your nearest Insul-Mastic representative handy. Please write and we'll send it. You can also find our catalog in Sweet's Process Industries and Engineering Files.**

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**OF AMERICA**

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# Where Unusual Resistance to Extreme Corrosives is Needed, These Coats Appear to be a Solution

**USES:** Baking-type intermediate recommended for formulation of protective coatings for drums, food containers, tank cars, air conditioning equipment, water tanks, general appliances, chemical tanks and process equipment, etc.

Multiple-coat systems are recommended for maximum chemical resistance—two to six coats used depending on the application and the severity of exposure. Single-coat systems are suggested for use where the application merely involves exposure to soaps, strong detergents, and similar materials.

**Features:** Formulated coatings exhibit unusual resistance to alkalis, acids, soap solutions, solvents, salts, oxidizing agents, and other corrosives over a wide temperature range. Resistance to salt spray is reported as excellent.

Film toughness, flexibility, resistance to marring and abrasion, and adhesion to metals, glass, wood, and plastics are outstanding mechanical characteristics.

Coatings apply by brushing, dipping, spraying, or roller coating. Baking is accomplished in standard equipment with conventional methods employed for other organic coatings. Can be pigmented to yield a variety of colored finishes.

**Description:** R-108 baking-type coating intermediate is based on selected phenol derivatives developed by this manufacturer. It has good storage life, may be modified

Density	1.15-1.20
Solidification Point	Below -50°F
Molecular Weight	Approx. 200
Color	Clear brown
Viscosity	2000-4000 cp @ 25°C
Free Water Content	2-4%
Solubility	Soluble in all polar solvents
Boiling Point	Boiling range begins at approx. 400°F with simultaneous curing

to meet a variety of end-product requirements, is compatible with other resin coatings, and is essentially 100% polymerizable. Physical properties of the intermediate are indicated above.

## Multiple-coat Systems

Suggested enamel formulation for these systems is: 100 parts R-108 intermediate; 10 parts polyvinyl formal (100

**Selected phenolics used in baking coats offer protection against 70% caustic soda at 125°F, 100% acetic or 75% sulfuric acid at room temperature**

mesh); 50 parts furfuraldehyde; 50 parts isopropyl alcohol (70% solution in distilled water); and 1.2 parts phosphoric acid.

Using a 70-30 mixture of isopropyl alcohol in distilled water as thinner, the formulation should be reduced to 30-35% solids content for spraying or dipping, reduced to 35-40% solids for brushing, and reduced to 40% solids content for roller coating.

Maximum cure for such a typical formulation (catalyzed with 1% phosphoric acid) is 3 minutes per coat, with 10 minutes final bake, all at 490°F. Minimum suggested cure is 10 minutes per coat, with 16 hours final bake, all at 300°F.

Chemical resistance of clear, cured films — varying between 5 and 6 coats—is shown by static vial immersion tests. In general, immersion was in progress for a period between one and two years. Films resisted alkalis (70% caustic soda at 125°F); organic acids (100% acetic acid at room temperature); phenols (phenol up to 140°F); strong oxidizing agents (nitric acid up to 10% at room temperature); alcohols (methanol, ethanol, isopropyl at room temperature); and mineral acids (sulfuric up to 75%, chromic up to 6%, phosphoric up to 85%, and saturated sulfurous, all at room temperature). In addition, films exhibit marked resistance to mineral and vegetable oils, ketones, aldehydes, other organic solvents, and numerous aqueous solutions.

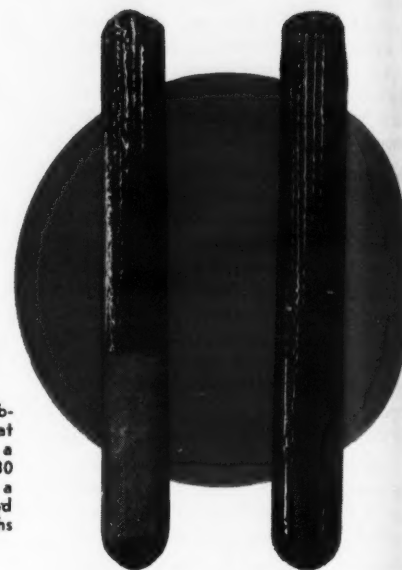
Hardness of cured multiple-coat films ranges between 83 and 88 Rockwell K (Shore Scleroscope 80-85). Mar resistance is very nearly that of ordinary window glass.

## Single-coat Systems

Recommended enamel formulation here is: 45 parts R-108 intermediate; 50 parts solvent (secondary butanol 85 parts, diacetone alcohol 15 parts); 5 parts polyvinyl butyral; 0.75 part phosphoric acid.

As in the case of multiple-coat systems, a 70-30 mixture of isopropyl alcohol in distilled water may be used for reducing the solids content to about 40% for spraying, and to below 35% for roller coating. Formulation may

Steel test probes were coated and subjected to a 16% caustic solution at 90°C. One on left, coated with a conventional phenolic, lasted just 30 minutes. One on right, covered with a coating formulated from R-108 selected phenolics was unchanged after 5 months



be used in an un-thinned state for dipping or brushing use.

Minimum bake of 30 minutes at 300°F is required to give a tough, flexible film; however, there is no need for close control of baking schedules. Variations from 30-60 minutes at 300-330°F give very satisfactory cures.

Single-coat films have shown no signs of failure when immersed in the following for a minimum of 1½ years at room temperature: water, methanol, benzene, gasoline, nitromethane, soya oil, and mineral oil. Soap resistance was illustrated in a test conducted over a period of 800 hours in which there was no film failure in a 1½% Gold Dust solution at 165°F.

Dry film thicknesses range from 1.0-1.5 mils for clear to 1.5-2.5 for pigmented films. Flexibility exceeds the limit of the ASTM mandrel test. To show heat aging properties, baking at 220°F for 800 hours has resulted in no deterioration in soap resistance. Films have withstood salt spray tests over a period of 8 months.

## General Factors

Surfaces to be coated must be clean; metal surfaces should be clean and passivated. Sandblasted and pickled surfaces coated with a polyvinyl butyral-zinc chromate primer — sprayed-on about 0.3-0.5 mil thick — are preferred. Phosphated surfaces, such as bonderized or parkerized, may also be used.

Numerous other thinners may be employed, including toluol, benzol, diacetone alcohol, many more. Suggested solvents include furfural, dichloroethylether, others.

**Source:** Product of the Chemical Department of the General Electric Company, Dept. CP, Pittsfield, Mass. . . . or for more information check CP 2918 on handy form, pages 2 and 3.

## Mechanically Stable, Clear-drying Resin Dispersions Have Partide-size Range of 0.5 to 5 Micron

Polyvinyl acetate products are useful in formulation of adhesives, textile finishes and paper coatings

**USES:** Resin dispersion 1040-14B is intended for formulation of adhesives, textile finishes and paper coatings.

Resin dispersion 953-7A is employed in compounding textile finishes and paper coatings.

**Features:** 1040-14B has a particle size of 1-5 microns, exhibits good mechanical stability, and dries to a clear film. Resistance to water is described as "excellent." 953-7A has a particle size of 0.5-2 microns, also has good mechanical stability, and dries to a clear film. Its resistance to water is "good."

Resins are highly stable in the presence of both heat and light, and are odorless, tasteless, colorless and non-toxic. They are not affected by inorganic salt solution, dilute alkalis and acids, although strong acids and alkalis tend to hydrolyze the resins, particularly at elevated temperatures.

**Description:** Products are prepared by emulsion polymerization of vinyl acetate monomer. The end products are stable, milky dispersions of solid resin in water. These dispersions can be diluted to desired concentration with tap water. The accompanying table summarizes some of the properties of the two dispersions.

The dispersions and their plasticizer- or resin-modified forms are easily combined with thickening agents to decrease costs, reduce settling at low concentrations, improve mechanical stability, increase blocking temperature of the dried film, improve "wet grab" and slow down adhesive setting time. For this purpose, many acid-stable, water-soluble resins, gums, starches, and cellulose derivatives can be used satisfactorily. Solvents or plasticizers can be used for thickening.

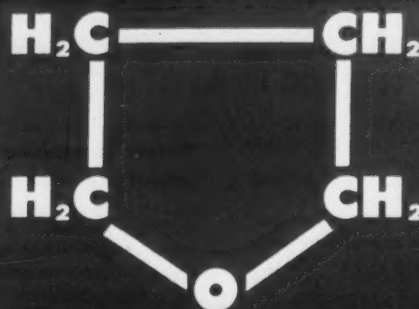
The normally acid pH of the dispersions can be raised to the neutral point or temporarily to the alkaline side by addition of dilute solutions of weak alkalis such as ammonia, triethanolamine, or by the addition of water-insoluble, mildly alkaline compounds such as zinc oxide, magnesium oxide or calcium carbonate. Buffer salts such as potassium acetate and disodium phosphate can also be used to raise the pH.

Solvents are added to the dispersions, particularly in the manufacture of adhesives, in order to increase viscosity, improve water resistance, increase gloss and improve adhesion to certain types of surfaces. They are also used for their effects on tacking characteristics. A wide variety of solvents is recommended.

Plasticizers are added to polyvinyl acetate to increase flexibility, improve water resistance and gloss, to increase tack and adhesion, and to lower the softening and heat-sealing temperatures of the dried film. Polyvinyl acetate is compatible with most of the ester-type nitrocellulose lacquer plasticizers. The lower phthalate and phosphate esters are effective plasticizers. Many plasticizers, ordinarily considered as too low-boiling for effective use, work well with polyvinyl acetate because the resin acts

(Continued on page 22)

## COMMERCIALLY AVAILABLE FROM DU PONT



### PHYSICAL PROPERTIES

Appearance	Colorless, mobile liquid
Odor	Ether-like
Molecular Weight	72.10
Boiling Range @ 760 mm.	65-67°C.
Specific Gravity, 20/4	0.887
Index of Refraction, N20/D	1.407
Flash Point	-17°C.
Vapor Pressure @ 25°C.	176 mm.
45°C.	385 mm.
65°C.	760 mm.
Solubility	Miscible with water and most common organic solvents

## TETRAHYDROFURAN

POWERFUL SOLVENT for

✓ HIGH MOLECULAR WEIGHT POLYVINYL CHLORIDE

✓ VINYLIDENE CHLORIDE COPOLYMERS

**H**ERE's the practical solvent for many difficultly soluble organic materials and resins. With TETRAHYDROFURAN, you can get solutions of comparatively high solids content at practical working viscosities. This property, together with the lack of color and low boiling point of TETRAHYDROFURAN, make it a most useful solvent for many resins and for production of clear, light-colored lacquers, adhesives and printing ink compositions.

### SOLVENT POWER

of less active solvents can be improved by additions of TETRAHYDROFURAN. For example, clear films can be cast from 10 to 15 percent solutions of high molecular weight polyvinyl chloride in a 65/35 mixture of TETRAHYDROFURAN with methyl ethyl ketone.

### EFFECTIVE ADHESIVE COMPOSITIONS

for plastics and films can be formulated with TETRAHYDROFURAN. Typical compositions include a 10 percent solution of polyvinylidene chloride in TETRAHYDROFURAN to seal polyvinylidene chloride sheets and bags. Also,

a 10 percent solution of polyvinyl chloride in TETRAHYDROFURAN is an effective adhesive for polyvinyl chloride sheets.

### TETRAHYDROFURAN WATER-MIXTURES

have unusual solvent power. The mixture is a better solvent than TETRAHYDROFURAN alone for materials such as cellulose acetate. Mixtures of TETRAHYDROFURAN with water are more effective solvents for alkalooids such as caffeine than either TETRAHYDROFURAN or water alone.

### FOR CHEMICAL REACTIONS

TETRAHYDROFURAN is an excellent solvent medium in which to carry out Grignard, lithium aluminum hydride and sodium acetylide reactions. Its ether structure and the wide range of organic materials which it dissolves suggest its use as a medium for other chemical reactions.

### AS A CHEMICAL INTERMEDIATE

TETRAHYDROFURAN reacts by substitution and fission of the ring. Among these reactions are dehydration, oxidation, chlorination, and acylation.

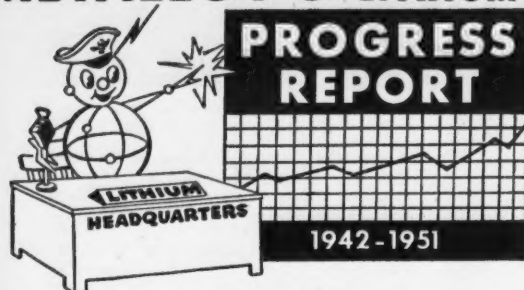
DU PONT  
ELECTROCHEMICALS



**A REQUEST** on your company letterhead will bring technical bulletins, price information, and samples if desired. Just write to E. I. du Pont de Nemours & Co., Electrochemicals Department, Wilmington 98, Delaware.

When inquiring check CP 2919 on handy form, pgs. 2-3

## METALLOY'S LITHIUM



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### Lithium Metal

Cup	1/5 lb.
Wire	1/8" dia.
Extruded Rod	1/2" & 3/8" dia.
Shot	4-8 mesh
Ribbon	1/4"
Cartridge (encased in copper tubing)	2.25, 4.50, 9.0 & 108.0 gram

### Lithium Hydride

### Lithium Amide

Specialists, Metalloy has developed special forms of Lithium and Lithium Compounds for many specialized applications. Check this list of ever expanding Lithium Salts, exclusive with Metalloy:

Aluminate	Manganite	Titanate	Zirconium
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As a Contribution to organized research, Metalloy's technical staff has prepared an Annotated Bibliography on the use of Organolithium Compounds in Organic Synthesis. Annual Supplements will follow.

Let Metalloy and Lithium go to work for you, today. Write Dept. CP for specific data on any of the above.

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When inquiring check CP 2920 on handy form, pgs. 2-3

Write Dept. G today for free sample.

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## Materials

# Thermally Stable Aromatic Sulfonyl Fluorides Resist Hydrolysis, Chlorination, Oxidation

Three compounds ready for evaluation as solvents, heat transfer media, dyestuff intermediates, chlorination media

**USES:** Three products are recommended for evaluation as solvents, heat transfer media, intermediates in manufacture of dyestuffs, and as chlorination media.

**Features:** Thermally stable, and resistant to hydrolysis, chlorination and oxidation. Although all three compounds are insoluble in water, they are soluble in a large number of organic solvents.

**Description:** Properties of these three materials—benzenesulfonyl fluoride, p-chlorobenzenesulfonyl fluoride and m-nitrobenzenesulfonyl fluoride—are presented in the accompanying table.

### SULFONYL FLUORIDE

	Benzene-	p-Chloro-	m-Nitro-
Appearance	Clear liquid	White solid	Yellow solid
Boiling Point, °C	209	229-230	143 (7 mm)
Melting Point, °C	—	46-51	45-47
Freezing Point, °C	Minus 5	—	—
Specific Gravity	1.329	1.475	1.582
Flash Point, °F	196	340	335
Fire Point, °F	235	385	360
Visc., cp, 20°C	2.27	—	—

In general, the aromatic sulfonyl fluorides are much less reactive than the aromatic sulfonyl chlorides. This is illustrated by the fact that these sulfonyl fluorides hydrolyze only slowly in boiling water and that p-chlorobenzenesulfonyl fluoride gives only a 4% yield of N-phenyl-chlorobenzenesulfonamide on refluxing with aniline for three hours at the boiling point of the mixture.

In some cases, however, increased yields may result from the use of the sulfonyl fluoride rather than the chloride. A yield of 93% of 2-chloroethyl-p-chlorobenzenesulfonate has been obtained by reacting p-chlorobenzenesulfonyl fluoride with ethylene chlorohydrin. Using the chloride, the yield was only 74%.

When p-chlorobenzenesulfonyl fluoride with a trace of ferric sulfate is heated to 180°C and a rapid stream of chlorine is passed through for one hour, the product is recovered unchanged. Under similar conditions, the analogous sulfonyl chloride yields a large percentage of p-dichlorobenzene.

Benzene- and p-chlorobenzenesulfonyl fluoride are recov-

ered practically unchanged after passage through glass, copper, stainless steel or monel packed tubes at 500°C and at a liquid space velocity of 0.01 ml reactant/ml packing/min. The vapor pressure and heat of vaporization of these compounds are comparable with those of liquids now in use as heat transfer media.

The materials, especially the benzene- and p-chlorobenzenesulfonyl compounds, are compatible with a variety of commercial resins.

**Source:** Evaluation samples are available from The Pennsylvania Salt Manufacturing Company, Dept. CP, 1000 Widener Bldg., Philadelphia 7, Pa. . . or for more information check CP 2922 on handy form, pages 2 and 3.

## Starches Converted by Peroxygen Compounds in Simple Process with Minimum of Control

Method makes it simple to obtain pastes of any viscosity with advantages over enzyme converted starches

**P**EROXYGEN compounds are being used for modifying starches, proteins and gums, so that it is possible to prepare high-solids, low-viscosity solutions of these materials. Hydrogen peroxide, peracetic acid and the persulfates have been, and are being, investigated for this application. Apparently, they do not affect desirable product properties.

Hydrogen peroxide modified starches are used in the textile industry for sizing of warps and fabrics. The warps run with less shedding and fewer breaks on the loom than with enzyme converted starches, and the sizing is easily removed by conventional desizing procedures. Such starches are also of interest for use as laundry starches, in the formulation of printing pastes, and in the paper industry as sizing and finishing agents.

These starches also find use in manufacture of adhesives and in preparation of drilling muds, where their peculiar gel-forming characteristics are valuable. Edible starches and starches for confectionery use may be prepared by hydrogen peroxide modification.

Conversion with hydrogen peroxide is applicable to all

pes of starch, such as corn, tapioca, potato and others. High degrees of conversion (determined by the amount of peroxide used), resulting in low viscosity pastes, are possible without simultaneous formation of objectionable amounts of reducing sugars and with a minimum of process control. The starch paste, regardless of the degree of conversion, will set upon cooling to a gel, in contrast to starch pastes produced by means of enzymes. This is thought to be responsible for the fact that hydrogen peroxide converted starches show superior properties, particularly in textile sizing.

With hydrogen peroxide, the same process can be used to produce either a starch paste or thin-boiling (soluble) starch. The difference in treatment is only that in the first case, treatment temperature is close to the boiling point, while in the last case, it is slightly below the gel point of the starch used. The soluble starch made by hydrogen peroxide conversion will yield, upon cooking with water, a starch paste of very nearly the same viscosity as obtained by applying the same amount of hydrogen peroxide directly to raw starch in cooking at high temperature. Thus, hydrogen peroxide conversion will produce starch pastes of any desired viscosity, free from degradation products (iodine test), in a simple process with a minimum of control.

Liquefied starch as used for textile or paper sizing is produced by treating a starch slurry with hydrogen peroxide in the presence of soda ash and a catalyst at temperatures close to the boiling point. Commonly used softening agents, such as sulfonated oils, tallow, etc., may be added if desired.

Thin-boiling starch, which upon cooling with water alone will yield a starch solution of low viscosity, is produced by treating a starch slurry with hydrogen peroxide in the presence of soda ash and a catalyst at temperatures slightly below the gel point of the starch.

Copper sulfate is the usual catalyst, although other copper salts are often satisfactory. Such a small amount of catalyst is required that the copper content of the converted starch is well below the limit set for most of the applications in which the starch is to be used. Soft water is recommended for slurrying the raw starch.

Ash content of the converted starch is approximately the same as that of the raw starch, even if no washing step follows the treatment. The dried, converted starch granules show the characteristic double-cross if viewed in polarized light under a microscope, indicating largely unchanged internal structure.

The possibilities of using commercial 40% peracetic acid in starch modification have not been fully explored as yet. Laboratory experiments indicate that highly fluid starch pastes result from treating corn starch with this reagent.

(Summarized from data procured from Buffalo Electro-Chemical Company, Inc., Dept. CP, Station B, Buffalo 7, N. Y. . . or for more information check CP 2923 on handy form, pages 2 and 3.

#### ASTM specs and test methods for petroleum products

Latest compilation of ASTM standards on petroleum products and lubricants gives 125 standards, including 112 test methods and 8 specifications. Numerous appendices add to the value of this 780-page book. To obtain "ASTM Standards on Petroleum Products and Lubricants", 1950 edition, remit \$5.50 (paper bound) or \$6.15 (cloth bound) direct to American Society for Testing Materials, Dept. CP, 1916 Race St., Philadelphia 3, Pa. When inquiring specify CP 2924 on handy form, pages 2 and 3.

FEBRUARY, 1951

ARMOUR

Chemical Division

### Economical red oil replacement available in Neo-Fat tall oil fatty acids

With the raw material situation as it is today, manufacturers are looking for uniform quality replacement products. Fractionally distilled tall oil fatty acids have found broad usage as red oil replacements, but what is more important, they've been consistently lower in price.

Fractional distillation of Neo-Fat tall oil fatty acids guarantees light color, mild odor, low unsaponifiable content and uniformity. Large scale commercial production of Neo-Fat tall oil fatty acids assures availability.

Neo-Fat S-142, one fraction, contains an average of 84% oleic-linoleic acids and 16% rosin acids. It is adaptable to the manufacture of jell, liquid and dry cleaning soaps. Other uses include cutting oils, special polishes, alkyd resins, latex foam and sponge rubber, liquid buffing compounds, carbon paper, ore flotation

— wherever a low titre unsaturated fatty acid is required.

Neo-Fat D-142 has an even lighter color and lower rosin acid content (6% resin, 94% oleic-linoleic acids). It can be used wherever Neo-Fat S-142 is used. Neo-Fat D-142 is especially adapted to the manufacture of alkyd resins which are non-yellowing, have superior water and alkali resistance and have excellent adhesion to metal.

#### Typical Analyses

	Neo-Fat S-142	Neo-Fat D-142
Mean Molecular Weight	295	284
Titre	Low	Low
Iodine Value (Wijs)	130	130
Neutralization Value	190	197
Color	2 NPA	Pale

### Non-adsorbing surface active agent for buffing compounds

Buffing compounds are used for cleaning and polishing metal surfaces, either before or after plating or before painting, lacquering or enameling. Since it is important that no residual trace of buffing compound be left on the polished surface, ease of cleaning is an essential factor. The addition of as little as 3 to 5% of Ethomid HT/60 to buffing compounds of either the liquid or emulsion type permits easy removal by simple water washing.

Ethomid HT/60 is a non-ionic surface active chemical with unusual properties. In testing a series of surface active chemicals, Armour chemists found that

Ethomid HT/60, unlike any of the other chemicals tested, lost none of its ability to lower surface tension after fine sand and abrasive material was added to the water. Since the concentration of Ethomid HT/60 in solution was very low, it was apparent that this product was not adsorbed on the abrasive materials.

Ethomid HT/60 is only one in a series of 44 polyethylene oxide derivatives of fatty amines, fatty amides and fatty acids offered in commercial quantities by the Armour Chemical Division. An informative 32-page technical booklet on the Ethomeens, Ethomids and Ethofats is available upon request.

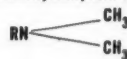


LOOKING FORWARD

Dimethylalkylamines are tertiary amines. Organic bases, they enter into reactions similar to primary amines in salt formation, but do not form carbamates as do primary and secondary amines.

**Solubility** — Dimethylalkylamines are insoluble in water and highly soluble in the usual organic solvents. Although water insoluble, they disperse readily in water to form stable emulsions. The dimethylalkylamines readily form highly soluble amine salts with acid solutions.

Dimethylalkylamines



**Application** — Dimethylalkylamines can be easily converted to quaternary ammonium salts. Because of this, they are expected to be important intermediates in the manufacture of germicides, textile-softening agents, cationic surface active agents, antioxidants, dye-fixing agents.

**Availability** — Research samples of dimethylalkylamine will soon be available for laboratory studies. If you will use the coupon, we'll send you a sample without charge or obligation.

Fatty Acids  
Long-Chain Fatty Acid Derivatives  
Industrial Oils

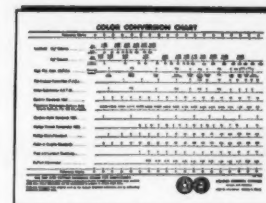
### Armour Chemical Division Adds Industrial Oils

The Armour Chemical Division announced recently that it had taken over the supervision and sales of the Armour Industrial Oils Department. This move will greatly improve customer service by making available the facilities of the Chemical Division's large research laboratory and the services of specially trained technical representatives.

For many years, Armour and Company has been recognized as a leader in the production of animal oils, tallow and greases. Armour plants are thoroughly equipped to produce every type of animal oil for which there is a demand today.

To acquaint industry with their line of industrial oils, the Armour Chemical Division is offering a chart containing specifications on all of their industrial oils. Use the coupon below to obtain your copy — without charge or obligation, of course.

### Free color conversion chart



You can obtain Armour's 8 1/2" x 11" color conversion chart by mailing the coupon below. This chart, printed on sturdy cardboard, covers the complete commonly used color-density range. It's a time-saving reference for laboratory, technical, production and purchasing personnel.

### Mail this Coupon

Please send additional information on

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•

Name..... Title.....

Firm.....

Address.....

City..... Zone..... State.....

ARMOUR Chemical Division

Armour and Company  
1351 W. 31st St., Chicago 9, Ill.

When inquiring check CP 2925 on handy form, pgs. 2-3

# SAVE TIME with these high-purity Sulfides

Rapid and complete solubility of Hooker Sodium Sulfide and Sodium Sulphydrate can mean substantial savings in time and manpower. The flakes dissolve almost instantly, without agitation, even in cold water . . . no sludge settles out, even after standing for hours.

The clean solution of sulfide or sulphydrate can be used immediately, without settling or decanting—a further time saver.

## SODIUM SULFIDE—Na<sub>2</sub>S

Mol. Wt. . . . . 78.1  
M.P. . . . . 100° C

Light buff colored solid in flake form. Rapidly soluble in water; slightly soluble in alcohol; insoluble in ether. Also available in solid form.

### ANALYSIS

Na<sub>2</sub>S . . . . . 60 to 62%  
NaCl . . . . . 1.5% Max.  
Other Na Salts . . . . . 2.0% Max.  
Fe . . . . . 8 ppm Max.  
Cu, Ni, Cr, Mn, Pb . . . . . 1 ppm Max.  
Water of crystallization . . . . . 35% Min.

### USES

In manufacture of dyestuffs, chemical intermediates, straw and kraft pulp, rubber, as an ingredient of dye liquor for textile dyeing; boiling out linen; ore flotation and metal refining; in unhairing hides and wool pulling; desulfurizing viscose rayon.

### SHIPPING CONTAINERS

Flake: Steel drums . . . . . 90 & 350 lbs. net  
Solid: Steel drums . . . . . 625 lbs. net

The high purity of Hooker Sodium Sulfide (Fe 8 ppm Max.) and Sodium Sulphydrate (Fe 5 ppm Max.) also helps you save process time by eliminating variations in quality. Painstaking uniformity, from one shipment to the next, enables you to get consistent results with your own product without varying your procedures.

Write today, on your company letterhead, for samples and Technical Data Sheets.

## SODIUM SULFHYDRATE—NaSH

(sodium hydrosulfide)

Mol. Wt. . . . . 56.1  
M.P. . . . . 55° C

Light lemon colored solid in flake form. Completely and rapidly soluble in water, alcohol and ether.

### ANALYSIS

NaSH . . . . . 70 to 72%  
Na<sub>2</sub>S . . . . . 2.5% Max.  
NaCl . . . . . 0.8% Max.  
Na<sub>2</sub>SO<sub>3</sub> and NaHCO<sub>3</sub> . . . . . 0.4% Max.  
Fe . . . . . 5 ppm Max.  
Cu, Ni, Cr, Mn, Pb . . . . . 1 ppm Max.  
Water of crystallization . . . . . 28 to 26%

### USES

In preparation of dyestuffs and other organic chemicals such as thioamides, thiourea, thioglycolic acid, thio- and dithio-benzoic acids, sodium thiosulfate; in unhairing hides, in desulfurizing viscose rayon.

### SHIPPING CONTAINERS

Lacquer-lined steel drums . . . . . 90 & 350 lbs. net

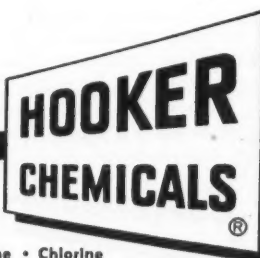
*From the Salt of the Earth*

HOOKER ELECTROCHEMICAL COMPANY

15 FORTY-SEVENTH ST., NIAGARA FALLS, N. Y.  
NEW YORK, N. Y. • WILMINGTON, CALIF. • TACOMA, WASH.

Benzoic Acid • Chlorotoluene • Sodium Benzoate • Caustic Soda • Muriatic Acid • Paradichlorobenzene • Chlorine

When inquiring check CP 2926 on handy form, pgs. 2-3



## MATERIALS

(Continued from page 19)

to lower the vapor pressure of the plasticizer to an extent where plasticizer loss by evaporation or diffusion is negligible. Esters of the higher fatty acids are not effective plasticizers for polyvinyl acetate. Certain materials not ordinarily considered as plasticizers for polyvinyl acetate, can be used as effective extenders for many active plasticizers.

In general, nitro, ester, free carboxyl, hydroxyl, polyphenolic or phenolic groups promote compatibility with polyvinyl acetate. Long-chain paraffinic hydrocarbons tend to be incompatible. The resins most widely used for compounding with polyvinyl acetate are nitrocellulose, Vinsol

## Properties of Polyvinyl Acetate Dispersions

	Polyco 953-7A	Polyco 1040-14B
Percent Solids*	55	55
pH	4.3-4.6	4-4.5
Percent Free Monomer, Max.	0.3	0.5
Viscosity, Cp	1250-1600	1000-1300
Settling Rate**	None	0.5 Max.
Solvent Tolerance***	4	3
Particle Charge	Anionic	Non-ionic
Blocking Temperature, °C	120	120
Heat Sealing Temp, °C	115-120	95-100

\*Dispersions with higher solids content are available.

\*\*Settling rate is determined by diluting dispersion to 5% solids in a 100 cc graduate and observing volume of settled particles after 24 hours. Values reported are cc.

\*\*\*Solvent tolerance is determined by measuring the parts of ethyl alcohol which can be blended with 100 parts of dispersion under high speed agitation.

phenolics, Santolites, Aroclors, and Nevillac. Non-compatible extenders such as starches, dextrans, water-soluble clays, calcium carbonate slurries, asphalt and wax emulsions can be combined with polyvinyl acetate emulsions to lower costs.

Addition of plasticizers, solvents, or brief baking of the dried films improves water resistance of films from polyvinyl acetate dispersions. Certain chemicals, such as aluminum formate, formaldehyde, glyoxal, sodium or ammonium dichromate, have a similar effect. Aqueous urea and melamine formaldehyde resins or dimethylol urea solutions are known to improve film properties.

Compatible pigments are: titanium dioxide, carbon black, iron oxides, lead carbonate, calcium sulfate, lithopone, antimony oxide and antimony sulfide. Compatible dyes are: Crocein Scarlet Moo 90, Basic Brown BR, Fuchsin Conc., Rhodamine B Extra and Orange G.

Vigorous agitation sometimes produces undesirable foaming of the dispersions. Compounding with solvents helps to reduce the foam. Effective antifoam agents include octyl alcohol, lanolin, pine oil, silicone resins and emulsions, and Lanolubric No. 2.

Source: American Polymer Corporation, Dept. CP, Peabody, Mass. . . . or for more information check CP 2927 on handy form, pages 2 and 3.

CHEMICAL PROCESSING

**Greater vitamin K activity  
than natural product . . .**

2-methyl-1,4-naphthoquinone is effective fungicide, bactericide; has many easily prepared derivatives

**Uses:** Compound is a vitamin K-active substance (anti-hemorrhagic activity). Effective also as a bacteriostatic and fungicidal agent. Chemical reactivity suggests its use, or use of some of its easily prepared derivatives, in various phases of food packaging and processing, cosmetics, pharmaceuticals, wood treating chemicals, textile and leather chemicals, and chemical specialties.

**Features:** Vitamin K activity of 2-methyl-1,4-naphthoquinone is more potent than that of natural vitamin K.

Undergoes oxidation, reduction, alkylation, dimerization, ketone reactions, addition reactions, Diels-Alder reaction, and other reactions, yielding a wide variety of end products. Anti-hemorrhagic vitamin activity is transmitted in varying degrees to many of its derivatives.

Toxic dose of this compound for humans is several hundred times as great as the therapeutic dose, offering a high safety factor for its use in certain applications.

**Description:** Empirical formula of 2-methyl-1,4-naphthoquinone is  $C_{11}H_8O_2$  and molecular weight 172.17. It is a bright yellow, crystalline solid melting at 106°C (pure). Volatility at 25°C is reported low; however, it has a slight tendency to sublime. It can be steam-distilled. Compound is readily soluble in benzene and other aromatic solvents, carbon tetrachloride and other chlorinated solvents, and diethyl ether. It is moderately soluble in methyl alcohol, ethyl alcohol, and ethyl acetate; sparingly soluble in water and petroleum ether.

Reports from literature point toward its potential applications. Tests were made on 50 fungicides (required to be free from mercury and halogens) for protecting Army Ordnance leather equipment from mold. Of those found effective, 2-methyl-1,4-naphthoquinone was effective at the lowest concentration (0.26% on the leather basis). Vitamin K<sub>3</sub>, a derivative of this compound, is an effective agent for use as a preservative for fruits and as a disinfectant for seeds. Here, it is effective against molds, yeasts, and bacteria in concentrations ranging from 0.001 to 0.03%, and can be used either in solution or as a dusting powder.

**Source:** Development of the Velsicol Corporation, Dept. CP, 330 East Grand Ave., Chicago 11, Ill. . . . or for more information check CP 2928 on handy form, pages 2 and 3.

**Presents organic analyses  
and organic reagents**

Conveniently divided into 3 sections, 263-page book treats organic analyses and organic reagents. First section lists major classes of organic compounds with reagents used in identification. Second section contains detailed discussion of these reagents, including step-by-step methods of preparation. Third section consists of melting point tables of organic derivatives, arranged alphabetically.

To obtain "Organic Reagents for Organic Analysis", 2nd edition, remit \$5 direct to Chemical Publishing Company, Inc., Dept. CP, 26 Court St., Brooklyn 2, N. Y. When inquiring specify CP 2929 on handy form, pages 2 and 3.

FEBRUARY, 1951

# CELANESE ANNOUNCES

## PRODUCTION OF 1,3 BUTYLENE GLYCOL

- Available in commercial quantities
- High boiling solvent and coupling agent
- Low toxicity
- Good humectant

Celanese\* 1,3 Butylene Glycol, a high boiling solvent and coupling agent, is interesting as a humectant, solvent, and lubricant in the textile, paper, ink and hydraulic fluid fields. Its low toxicity and hygroscopicity suggests its application in the tobacco, cosmetic and pharmaceutical industries. It is a versatile intermediate for surface active agents, rosin esters and allows production of polyester plasticizers with high dielectric constants for use in electrical insulation compounding.

**PROPERTIES**

Molecular weight . . . . .	90.12
Form . . . . .	Sweet viscous liquid
Boiling pt. (760 mm) °C . . . . .	204
Flash pt. °F . . . . .	250
Sp. Gr. 20/20 . . . . .	1.0045
Refractive Index 20°C . . . . .	1.4368
Freezing Point °C . . . . .	Below -50
Viscosity in cps at 35°C . . . . .	89
Vapor Pressure 20°C in mm Hg . . . . .	0.06
Solubility in water . . . . .	Complete
Hygroscopicity—% water pick up at 80°C, 100% R.H. in 144 hrs. . . . .	66
Lbs. per gallon . . . . .	8.4

Investigate Butylene Glycols by writing for Celanese Bulletins.  
Celanese Corporation of America, Chemical Division, Dept. 505-B  
180 Madison Avenue, New York 16.

**2,3 BUTYLENE GLYCOL**

Drum quantities of 2,3 Butylene Glycol of high purity are now available. The adjacent hydroxyl groups of this glycol make it interesting as a chemical intermediate for cosmetics, pharmaceuticals, resins, elastomers, and chemical specialties.



\*Reg. U.S. Pat. Off.

ACIDS • ALCOHOLS • ALDEHYDES • GLYCOLS • KETONES • PLASTICIZERS • SOLVENTS

When inquiring check CP 2930 on handy form, pgs. 2-3

Jefferson's new chemical

intermediate  
stabilizer  
plasticizer

# ALKYL PHENOL C-9

Properties of Jefferson Alkyl Phenol C-9 indicate a wide range of application as

1. an intermediate for non-ionic detergents
2. a stabilizer for ethyl cellulose
3. a plasticizer for cellulose esters
4. an intermediate for other plasticizers
5. a starting material for production of lubricating oil additives and rubber chemicals
6. an antioxidant

A typical  
description of  
Jefferson  
Alkyl Phenol  
C-9 is:

Specific Gravity, 20/4 C	0.949
Hydroxyl Number	255
Color, Pt-Co Scale	200
Refractive Index, 20° C	1.5140
Flash Point (TOC), °F	300
Distillation Range, °C (Modified ASTM)	
IBP	290.0
5 ml.	293.0
50 ml.	295.0
95 ml.	296.5
EP	298.0

You may secure technical information and experimental samples for research and product development by writing (on your company letterhead, please) to our Market Development Division, Dept. D.

A Jefferson ethylene unit (purification section), Port Neches, Texas.



## Jefferson Chemical Company, Inc.

711 FIFTH AVENUE, NEW YORK 22, N. Y.



ESSENTIAL CHEMICALS FROM HYDROCARBON SOURCES

ETHYLENE OXIDE  
DIETHYLENE GLYCOL  
ETHYLENE DICHLORIDE  
ETHYLENE GLYCOL

## Briefs

### From recent literature

Dichlorobutadiene resins can be stabilized against discoloration and other deterioration by using as little as 0.5% by weight of a 4-alkylphenyl salicylate prepared from nonylphenol.

Polyethylene's surface characteristics can be improved by water soluble alkyl aryl polyglycol ethers. These are made from alkyl phenol and ethylene oxide and applied as an aqueous solution containing from 0.25% to 10% by weight of the ether. Deposition should amount to two to fifty milligrams of alkyl aryl polyglycol ether per square yard of film surface. Deposition temperatures should be maintained within the range 0° to 45°C.

Long chain compounds of the alkyl heterocyclic type can be made by condensing 2-nitro- or 2-amino-4-alkyl phenols with suitable substances to affect ring closure. Resulting products show properties not demonstrated by their unsubstituted or short-chain homologues.

An addition agent for mineral oil lubricants is produced by causing a long chain phenol to react with sulfur monochloride and phosphorus sesquisulfide. This additive confers excellent pressure-carrying, corrosion-inhibiting and detergent properties on the oils. Corrosion-inhibiting properties may be increased by adding a condensation product of the aluminum salt of the alkyl phenol derivative and formaldehyde or a formaldehyde-yielding product.

These developments are abstracted from recent publications of U. S. patents. The uses may suggest other applications of Jefferson Alkyl Phenol C-9 in your products or processes.

## MATERIALS

### Uses of emulsion adhesive are many and varied . . .

stable, resin-rubber product has quick grab and good adhesion; clear films resist water

Uses: Laminating paper, metal foils, fabrics and leather to themselves or to glass, metal, asphalt, cork wood and plastics. Being used as replacement for polyvinyl acetate base emulsions for many wet stick applications.

Features: Quick grab and good adhesion. Emulsion is highly stable, and is not affected by iron, copper or brass. Bond is very water resistant. Films are clear, practically colorless, odorless, and unaffected by extremes of temperature and humidity.

Description: General-purpose synthetic resin-rubber emulsion with water as diluent. Specifications of ARCCO 539-10A are tabulated below.

Solids	42.0%
pH	8.9
Viscosity @ 25°C	850-1000 cps
Lb per gal	8.45

Analogs of 539-10A having the same properties and specifications but with other viscosities are offered. These are ARCCO 538-46 (viscosity 1200-1400 cps) and ARCCO 710-8C (4000-6000 cps).

Adhesive is useful as a compounding additive for starch adhesives to impart tack, flexibility and water resistance. Aliphatic, aromatic, chlorinated or ketone solvents may be added to increase "bite" to surfaces not readily "wet" by the emulsion itself. With bentonite sols or salt-free dextrans, tin pastes can be compounded.

While formulated primarily as a wet stick adhesive, modifications are available which maintain prolonged tack after drying.

Source: Product of American Resinous Chemicals Corporation, Dept. CP, 103 Foster St., Peabody, Mass. . . . or for more information check CP 2932 on handy form, pages 2 and 3.

### Folders report on evaluation of vinyl fillers, stabilizers

Two 10-page folders should have interest for plastics molders, extruders, laminators and fabricators. The first, "Evaluation of Stabilizers for Vinyl Stocks Containing Chlorowax 40," reports the results of a lab study of two standard stabilizer formulations. Light and heat stability characteristics of each are concisely summarized.

This folder includes a table that presents chemical composition, cost per pound, physical form, and specific gravity of 22 different stabilizers produced by 16 manufacturers. Recommended stabilizers for vinyl stocks containing Chlorowax 40 are listed.

Second folder, Bulletin No. 4—"Evaluation of Inert Fillers in Vinyl Plastics," explains an evaluation study encompassing nine fillers. It tells the recipe employed, and the method followed to determine filler concentration. Effects of loading vinyl plastics with each filler on cost, stress-strain and crescent tear are tabulated. Two charts graphically depict tensile strength and crescent tear characteristics.

Folders are published by Diamond Alkali Company, Dept. CP, 300 Union Commerce Bldg., Cleveland 14, Ohio. When inquiring specify CP 2933 on handy form, pages 2 and 3.

When inquiring check CP 2931 on handy form, pgs. 2-3

## MATERIALS

### Matte finish is uniform with flattening agent in lacquer . . .

synthetic silica product will not cause film deterioration

**Uses:** Flattening agent for lacquers.

**Features:** Provides positive control over degree of matte finish obtained. Does not cause deterioration of film properties. Mixes readily and quickly in the mills with other lacquer constituents.

**Description:** Syloid 308 contains no organics. It consists of synthetic silica, the particle size of which can be controlled and guaranteed from batch to batch so that uniform results can be expected from lacquers in which the agent is used.

**Source:** Development of The Davison Chemical Corporation, Dept. CP, Baltimore 3, Md. . . . or for more information check CP 2934 on handy form, pages 2 and 3.

### Parts made of special neoprene withstand 0.003% ozone for six hours . . .

withstand -87°F, petroleum products, wear, constant flexing

**Uses:** Neoprene rubber compound for uses where resistance to petroleum products and derivatives, small amounts of ozone, prolonged weathering, constant flexing, and wear resulting from metal-to-rubber contact are involved.

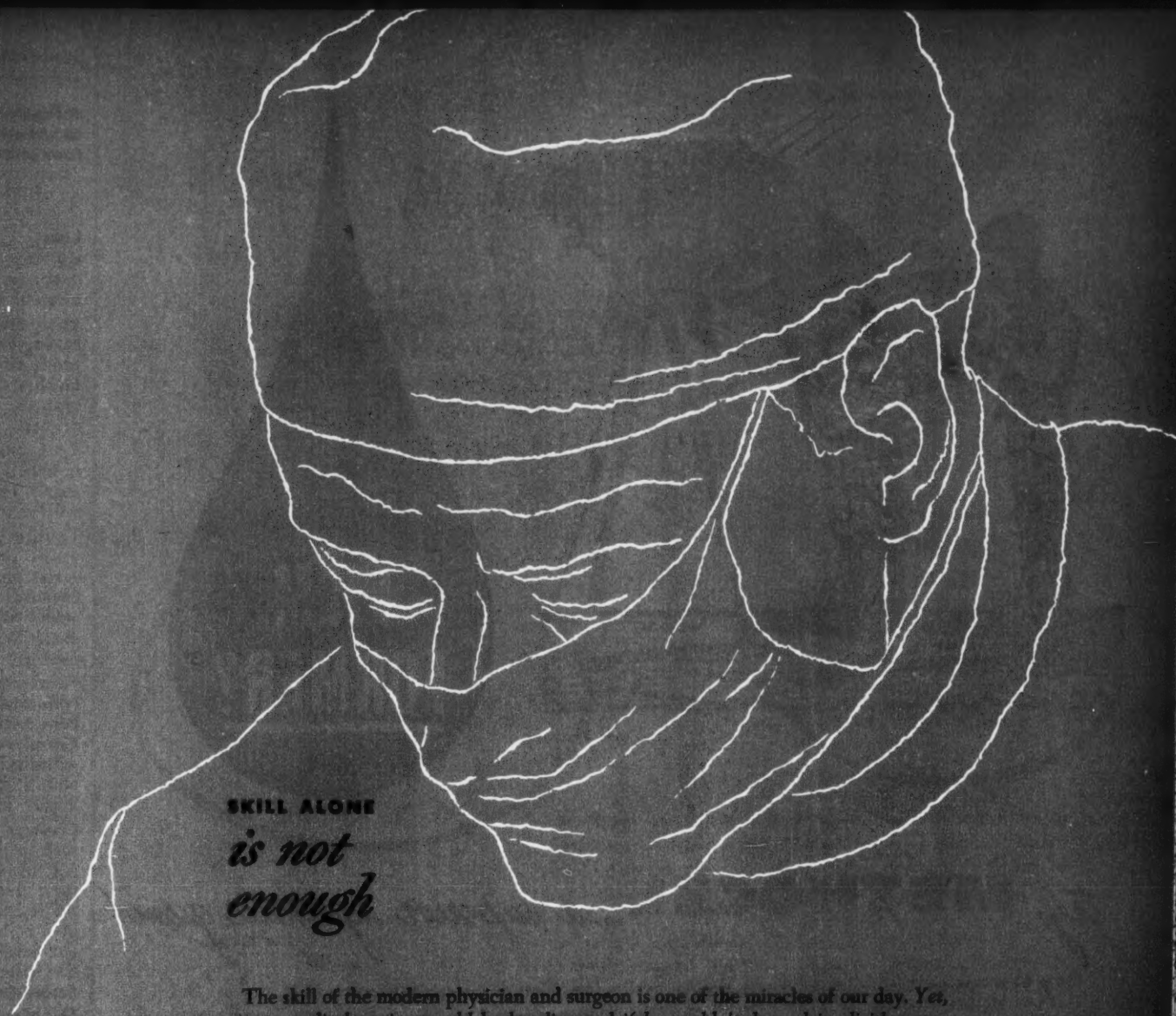
**Features:** Compound has withstood concentrations up to 0.003% ozone for six hours. In addition, it has withstood temperatures as low as -87°F and as high as 240°F.

**Description:** The rubber was developed for production of a molded cover designed for use as a grease retainer on aircraft universal joints.

A wide variety of molded, lathe-cut, extruded or punched rubber parts can be produced to specifications. Tensile strength is 2315 psi, durometer hardness 60, elongation 400%, and permanent set 3%.

**Source:** No. 808 neoprene-based compound is made by The Stalwart Rubber Company, Dept. CP, 221 Northfield Rd., Bedford, Ohio . . . or for more information check CP 2935 on handy form, pages 2 and 3.

For more information on product at right, specify CP 2936 . . . see information request blank between pages 2-3.



SKILL ALONE

*is not  
enough*

The skill of the modern physician and surgeon is one of the miracles of our day. Yet, even a medical genius would be handicapped if he couldn't depend implicitly upon those to whom he must look for his tools—the diagnostic media, the anesthetics, and the drugs with which he has learned to relieve pain, conquer illness and turn back death.

In supplying the medical profession, we have no margin for error, no room for compromise with scientific and business integrity—and we feel the same sense of obligation to industry, which also leans heavily upon its suppliers to augment inventive skills and manufacturing techniques.

For 84 years, Mallinckrodt has served the chemists and production engineers of industry with an exacting conscience in supplying fine chemicals by the carload, the ton—or by the pound. *Precise chemical processing is our business.*

MALLINCKRODT CHEMICAL WORKS • St. Louis • New York



INORGANIC CHEMICALS • PHOTOGRAPHIC  
CHEMICALS • ORGANIC INTERMEDIATES •  
OVER 400 ANALYTICAL REAGENTS • METALLIC  
SOAPS • CHEMICALS FOR ELECTRONIC USES •



BETTMANN ARCHIVE

do  
you  
need a  
better  
**FILM  
FORMER?**

try **METHOCEL** ... a superior synthetic gum!

For films that are *strong, tough and flexible*, try Methocel (Dow Methylcellulose). As a film former in many applications, Methocel is unsurpassed. In addition to strength and flexibility, Methocel is impervious to oils, greases and waxes. It is colorless, odorless, tasteless . . . water-soluble, stable in alkali or dilute acids . . . and closely controlled in manufacture so that batch after batch is of the same high, dependable quality.

The film forming properties of Methocel are of wide application in sizing . . . such as paper and paper board. It improves the filming properties of water, emulsion and latex paints. It is useful as a mold release or parting agent. For protective hand creams or

medicinal ointments, Methocel is ideal.

This chemical of ever-growing usefulness offers many qualities in addition to film forming. Methocel is also widely used as a thickener, binder, emulsion stabilizer and suspending agent. In industry after industry, Methocel is improving products, making processing easier.

We invite you to try Methocel. Write Dept. ME-32 for a free, experimental sample of *powdered* Methocel, stating potential application or viscosity desired.

THE DOW CHEMICAL COMPANY

MIDLAND • MICHIGAN



When inquiring check CP 2937 on handy form, pgs. 2-3

## MATERIALS

**Adhesion, flexibility, resistance to chemicals are features of four coating resins . . .**

products are used in air-dry and baking enamels, can coatings, primers, tank linings, other finishes

**Uses:** Each of these four basic types of resins, although they are in the same series, possesses individual properties which qualify it for use within a given segment of the industry.

Epon 1001 is intended for formulation of industrial baking enamels. Epon 1004 should find application in the production of varnishes, spar varnish, "wipe-on" type finishes, porch and deck finishes, industrial baking enamels, air-dry industrial enamels, and industrial primers.

Epon 1007 is intended for use in industrial primer, industrial baking enamels, can coatings, and drum linings. Epon 1009 can be employed in formulation of wire enamels, can coatings, and tank linings.

**Features:** *Adhesion* . . . Finishes based on these resins provide outstanding adhesion over wood and metal surfaces, even without the customary priming or chemical pretreatment. Combinations of some of the resins with phenolics and other materials have shown shear strengths of 3,000 to more than 5,000 psi when used for bonding together aluminum blocks.

*Flexibility* . . . Finishes containing Epon resins exhibit both extreme hardness and unusual flexibility. Some have been tested by bending over a conical mandrel and by Gardner impact tester. The same finish was found to withstand the bending without failure, and to withstand both a 28 in.-lb direct bump and reverse bump on the impact tester.

*Chemical resistance* . . . Many common household items, such as lipstick and mustard, and most common acids do not discolor or dull surfaces of finishes formulated with these resins. The most spectacular example, however, is the resistance to alkali, soaps and detergents. Films have been boiled in 50% caustic for more than two hours without being affected. Other films have withstood close to 186 hours immersion in a 2% soap solution at 160°F before the appearance of small blisters.

**Description:** Some of the physical and chemical characteristics of Epon resins are tabulated in the table accompanying this article. These resins may be used

### CHARACTERISTICS OF EPON RESINS

	1001	1004	1007	1009
Physical Appearance	All are hard and brittle			
Melting Point, °C	64-76	97-103	127-133	145-155
Color (Gardner), max*	8	6	8	11
Viscosity (Gardner-Holdt)*	C-G	R-T	Y-Z	Z-Z
Pounds per Gallon	10.05	9.63	9.56	9.92
Refractive Index, 20°C	—	1.60	1.60	1.60
Approx. Equivalent Weight**	130	175	190	200

\*40% solution in butyl carbitol.

\*\*Grams of resin required to completely esterify one mol of monobasic acid, e.g. 350 gram of rosin or 280 grams of C<sub>18</sub> fatty acids.

in surface coatings either in the unmodified form, or modified with various fatty acids. The esters are prepared in much the same manner as alkyl resins. The same techniques and equipment are utilized, but slightly higher temperatures (500 to 525°F) may be employed to advantage.

Epon 1001 possesses the lowest molecular weight of the

CHEMICAL PROCESSING

surface coating Epon resins currently available. It is most useful in applications requiring the greatest degree of solubility and compatibility with other resins and oils. These applications may involve cooked vehicles; however, 1001 is also used in cold-blended formulations with other modifiers.

Epon 1004 is the most widely used Epon resin in preparation of cooked vehicles. It can be esterified with fatty acids, rosin or other resin acids, tall oil, or mixtures of these with limited amounts of dibasic acids. The finished esters can be air-dried or baked, depending on the modification, combined with 10 or 30% urea-formaldehyde, melamine-formaldehyde, or phenolic resin to provide baking vehicles.

Epon 1007 is most widely used in unmodified or cold-blended formulations. It is cured by reaction with small amounts of urea or melamine-formaldehyde resins, or heat-convertible phenolic resins.

Since Epon 1009 is the highest molecular weight member of the current series of Epon resins, it offers rapid cure, extreme chemical resistance, and excellent flexibility, in addition to unusual heat resistance.

Source: Epon resins are made by Shell Chemical Corporation, Dept. CP, 50 W. 50th St., New York 20, N. Y. . . . or for more information check CP 2938 on handy form, pages 2 and 3.

#### Machinable stainless steel is corrosion resistant

Twenty-page booklet describes analysis, corrosion resistance, and working characteristics of a rolled stainless steel that provides the engineering advantages of high corrosion resistance combined with fabrication and machining qualities of an 18-8 grade. Outstanding feature is steel's resistance to hot sulphuric acid and nitric-sulphuric acid mixtures. It is available as bars, wire, strips, forging billets, tubing, pipe, sheet, and plate.

Summary table of field reports gives corrosion resistance rating of the steel in numerous job applications. Another table reports general corrosion resistance of steel against more than 140 acids and corrosives. Typical applications reported include mixing tanks, heat exchangers, process piping, pump shafts and rods, valve stems, bolts, nuts, washers, tie rods, and pickling racks.

Booklet also includes tables of physical constants, nominal mechanical properties, mechanical properties of the cold drawn form, and coefficient of expansion. Heat treatment, workability, and recommended speeds for machining are also given. "Carpenter Stainless No. 20" is issued by The Carpenter Steel Company, Dept. CP, 1937 Palmer St., Reading, Pa. When inquiring specify CP 2939 on handy form, pages 2 and 3.

#### Covers polishes, cleansers, and allied specialties

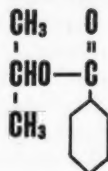
Written by Milton A. Lesser, 514-page book covers formulation and manufacture of many polishes, cleansers, detergents, and allied chemical specialties. Each of its 42 chapters deals with a different specialty, including formulas and manufacturing methods. Latest developments are included. To obtain "Modern Chemical Specialties", remit \$7.25 direct to Mac Nair-Dorland Company, Dept. CP, 254 W. 31st St., New York 1, N. Y. When inquiring specify CP 2940 on handy form, pages 2 and 3.

are you looking for

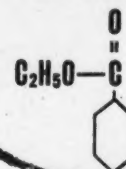
- high boiling solvents for resins, dyes, and inks?
- ready sources of benzoic acid via ester exchange?
- ingredients for perfumes?

then check these ALKYL BENZOATES

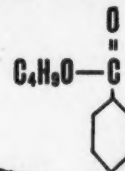
#### ISOPROPYL BENZOATE



#### ETHYL BENZOATE




#### n-BUTYL BENZOATE

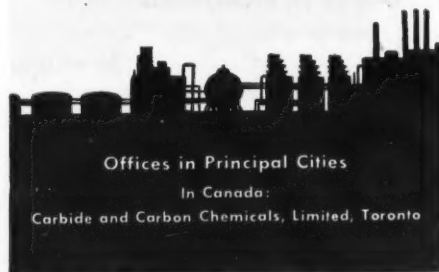


Isopropyl benzoate is available NOW in commercial quantities; ethyl and butyl benzoates in development quantities. Another member of the series, methyl benzoate, is available in research quantities.

For trial samples or for technical assistance, call or write the nearest Carbide and Carbon Chemicals office today. Ask for our technical bulletin "Alkyl Benzoates," (F-7589). It provides you with additional data and is a permanent reference for your work.

## CARBIDE AND CARBON CHEMICALS DIVISION

Union Carbide and Carbon Corporation  
30 East 42nd Street  New York 17, N. Y.



Offices in Principal Cities

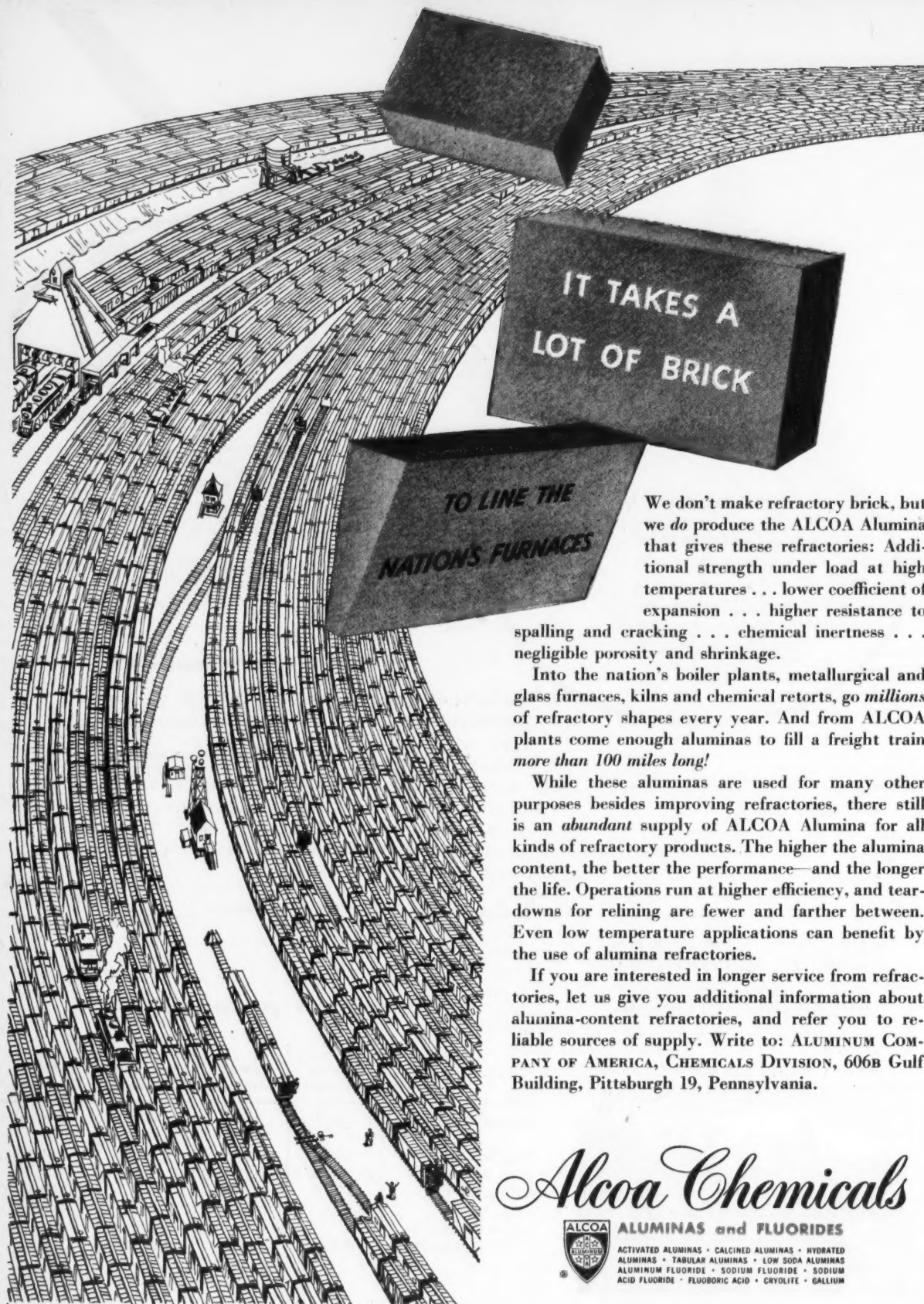
In Canada:

Carbide and Carbon Chemicals, Limited, Toronto

### physical properties

	Methyl Benzoate	Ethyl Benzoate	Isopropyl Benzoate	n-Butyl Benzoate
Molecular Weight	136.1	150.2	164.2	178.2
Specific Gravity	1.088	1.048	1.011	1.007
Boiling Point, °C.	198.9	212.8	219	249.4
Vapor Pressure at 20° C., mm. Hg	0.37	0.18	0.12	0.13

When inquiring check CP 2941 on handy form, pgs. 2-3



We don't make refractory brick, but we do produce the ALCOA Alumina that gives these refractories: Additional strength under load at high temperatures . . . lower coefficient of expansion . . . higher resistance to spalling and cracking . . . chemical inertness . . . negligible porosity and shrinkage.

Into the nation's boiler plants, metallurgical and glass furnaces, kilns and chemical retorts, go millions of refractory shapes every year. And from ALCOA plants come enough aluminas to fill a freight train more than 100 miles long!

While these aluminas are used for many other purposes besides improving refractories, there still is an abundant supply of ALCOA Alumina for all kinds of refractory products. The higher the alumina content, the better the performance—and the longer the life. Operations run at higher efficiency, and tear-downs for relining are fewer and farther between. Even low temperature applications can benefit by the use of alumina refractories.

If you are interested in longer service from refractories, let us give you additional information about alumina-content refractories, and refer you to reliable sources of supply. Write to: ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 606B Gulf Building, Pittsburgh 19, Pennsylvania.

# Alcoa Chemicals



**ALUMINAS and FLUORIDES**

ACTIVATED ALUMINAS • CALCINED ALUMINAS • HYDRATED ALUMINAS • TABULAR ALUMINAS • LOW SODA ALUMINAS  
ALUMINUM FLUORIDE • SODIUM FLUORIDE • SODIUM ACID FLUORIDE • FLUOBORIC ACID • CRYOLITE • GALLIUM

When inquiring check CP 2942 on handy form, pgs. 2-3

## MATERIALS

### Active area of adsorptive powder is 120 sq m/gm . . .

ultra-fine particles make product useful as flattener, filler, bodying and anti-caking agent .

**Uses:** Filler, flattener, polisher, strengthener and bodying agent. Useful as a conditioner for adjusting bulk and for improving flowability and dispersion characteristics of dense materials. Material is also an excellent anti-caking, parting and coating agent. It imparts free-flowing qualities to dusts and granulated powders by virtue of its shape characteristics, fine particle size and sorptiveness. It adsorbs surface moisture, prevents crystal growth, and prevents caking of heat-sensitive compounds.

**Features:** Ultra-fine state of particles provides exceptional covering power, ready dispersion in liquids and increased overall efficiency; spicular shape promotes adherence. Has 64% dead-air space or pore volume. Total active surface area is 120 square meters per gram. Low cost.

**Description:** Attaclay SF is a hydrated aluminum magnesium silicate, chemically inert and essentially neutral. Particles all lie in the sub-sieve range, average size being 0.4 to 0.6 micron. By weight, 90 to 95% is finer than 10 microns. Bulk density is 13 to 15 lb per cu ft. Oil absorption index, by ASTM rub out method, is 125-130. The clay wets almost instantaneously in water, and disperses readily to a moderately stable suspension. Color is light cream; index of refraction, 1.56.

Currently, small samples from pilot plant production are being offered for evaluation. Larger amounts can be made available.

**Source:** Attapulugus Clay Company, Dept. CP, 210 W. Washington Square, Philadelphia 5, Pa. . . or for more information check CP 2943 on handy form, pages 2 and 3.

### Four polyester resins intended for binding and laminating applications . . .

formulators find that storage-stable granules and powders are easy to use

**Uses:** Four polyester resins. G-382 and G-393 have principal applications in lamination of Fiberglas, paper, plywood, cotton, rayon, nylon, etc. In such cases, the polyester resin functions as alkyl component of low-pressure laminating resins, when dissolved in copolymerizing agents such as styrene or other monomeric vinyl compounds.

G-395 and G-397 act as binders in the formation of mats, and preformed shapes from fibers such as glass, asbestos, paper, cotton, rayon and other synthetics. The resins are also applied as binders in the making of sheets and forms from such materials as cork, sand and wood.

**Features:** All four are stable in storage. G-382 and 393 are easily dissolved in styrene at ordinary temperatures, thereby giving the formulator individual control over the stability, composition, physical properties and uniformity of cure of his laminating resins. They are non-blocking.

The other two resins, G-395 and 397, exhibit very low discoloration on curing. They promote wetting of fibers while reducing "washing" of fibers by laminating resins.

**Description:** G-382 and 393 are in the form of solid granules that are soluble in ethyl acetate, butyl acetate,

CHEMICAL PROCESSING FEB

## MATERIALS

benzene, toluene, methyl ethyl ketone, styrene and other monomeric vinyls. Cure of polyesters in styrene is effected in the usual way with 0.5 to 1.00% benzoyl peroxide at 220 to 360°F. Other catalysts may be used. A promoter may be used for low-temperature cure, or to speed the cure.

G-395 is a powder ground to specification, usually all to pass 20 or 40 mesh. It contains 3% Luperco AS as catalyst. G-397 is the same as 395, but it contains titanium dioxide pigment. It is intended for use where products of exceptional whiteness are desired, without resin spotting.

### GENERAL CHARACTERISTICS

	G-382	G-393	G-395 & 397
Acid No.	15-20	10-15	30-35
ASTM Soft Point, °C	90-100	80-90	—
Fischer-Johns MP, °C	—	—	98-102
Color as Cast	Amber	Amber	Amber
Appearance	Amber	Amber	Buff-white (40 mesh)
Viscosity in Styrene, 25°C			
35% Styrene	13,000 cp	3100 cp	—
45% Styrene	750 cp	525 cp	—
Bulk Density, 40 mesh	—	—	39-40 lb/cu ft

The above constants are for the uncatalyzed, unpigmented resins.

Source: Atlas Industrial Chemicals Department, Atlas Powder Company, Dept. CP, Wilmington 99, Del. . . or for more information check CP 2944 on handy form, pages 2 and 3.

### Set of matched sheets describes 2 paints

Twin data sheets give descriptions, features, and specifications for two paints. One is aluminum; the other is white, of an enamel type. Both resist corrosion, and can be used on metal, masonry, and wood. They can be applied by brush or spray over most old paints, and are non-toxic. No special primers are needed. They retard fungus growth, dry fast enough for 2 coats to be applied in the same day.

Aluminum paint comes ready-mixed; makers reports that it stays bright longer than any other aluminum coating of its kind. It offers a hard, flexible film that resists abrasion. It is unaffected by acids, alkalis, oils, water, and corrosive fumes. Inflammable, it must not be applied without sufficient ventilation. In general, surface to be painted requires preparation to some extent.

White paint is reported to be the whitest paint of its type made. Maker says it will not yellow or otherwise change color, either indoors or outdoors. It is unaffected by the strongest alkali cleaning solutions, and withstands acid and alkali spills, drips, and fumes. It is waterproof. It too offers a hard, flexible film that resists abrasion. It can be applied to damp surfaces and dries to a high gloss. Surface to be coated needs some preparation.

"Aluminum B 99" and "White B 81" are both issued by David E. Long Corp., Dept. CP, 220 E. 42nd St., New York 17, N.Y. When inquiring specify CP 2945 on handy form, pages 2 and 3.

## Are you a volume consumer of synthetic detergents?



Are you interested in saving almost half of your detergent costs? Then ULTRAWET 35KX is your answer. This new member of the Atlantic family of alkyl aryl sulfonates is tailor-made to combine excellent performance and ease of handling.

ULTRAWET 35KX is a light amber slurry, containing a minimum of 35% solids of which 90% is active. The extremely low inorganic salt content insures a wide variety of uses, including textile processing, emulsion polymerization and as a charge stock for drying operations. The ingredient is a high molecular weight alkyl aryl sulfonate characterized by exceptional foaming, wetting and detergent qualities. An important feature is that ULTRAWET 35KX has a low haze point —90° F.—for ease in handling and storage.

To take full advantage of the real economies offered by the use of ULTRAWET 35KX, bulk storage facilities are necessary. Atlantic can be of real assistance in furnishing engineering details for such facilities. Call on us. The Atlantic Refining Company, Chemical Products Section, 260 S. Broad St., Philadelphia 1, Pa.



#### In the East

**THE ATLANTIC REFINING COMPANY**  
Philadelphia • Pittsburgh • Providence  
Charlotte • Chicago

#### On the West Coast

**L. H. BUTCHER COMPANY**  
San Francisco • Los Angeles • Seattle  
Salt Lake City • Portland • Oakland

#### In Canada

**NAUGATUCK CHEMICALS**  
Division of Dominion Rubber Co., Ltd., Canada  
Elmira • Montreal • Toronto • Windsor  
Winnipeg • Saskatoon • Calgary

When inquiring check CP 2946 on handy form, pgs. 2-3



VICTOR'S STEEL-LINER ...  
NEW STAINLESS STEEL TANK  
CAR FOR 85% PHOSPHORIC  
ACID. CAPACITY: 4,000  
GALLONS.

# with emphasis on service...

## PHOSPHORIC ACID USES:

- Manufacture of:  
yeast, sugar, soft drinks,  
imitation jellies, gelatin,  
pharmaceuticals
- Rustproofing, engraving,  
railroad car cleaning,  
refining oil and gasoline,  
preserving silage
- Weighting silk, dyeing textiles
- Chemical polishing and electro-  
polishing metals, bright-dip  
baths for aluminum
- Manufacture of  
phosphates, dental cements, glue,  
ceramics, glass, metal treating  
compounds, explosives, fertilizers

### Containers for Victor Phosphoric Acid:

TANK CARS,

55 GAL. STAINLESS STEEL DRUMS,

13 GAL. GLASS CARBOYS.



## VICTOR CHEMICAL WORKS

141 West Jackson Boulevard • Chicago 4, Illinois  
A. R. Maas Chemical Co., Division • 4570 Ardine St., South Gate, California

When inquiring check CP 2947 on handy form, pgs. 2-3

## MATERIALS

### Hammer finish formulation for horizontal or vertical surfaces...

provides good duplication of pattern when sprayed and baked on either type of surface

A hammer finish formulation that gives good duplication of pattern when sprayed or baked in a horizontal or vertical position is the result of laboratory work at Rohm & Haas Company. The formulation incorporates this manufacturer's Uformite F-233 and Amberlac 80X resins with suitable anti-skinning and anti-silking agents. Sagging and after-flow are reported to be eliminated. The National anti-skinning agent ASA accelerates formation of the hammer finish and also helps to eliminate orange-peel surfaces. Formulation is given in following table:

	Lb
Amberlac 80X (70% solids)	114.0
Uformite F-233 (50% solids)	40.0
Alcoa Superfine lead-free aluminum #1594	3.0
National anti-skinning agent ASA	0.5
GE silicone oil 81069 (1% solids in xylol)	1.0
Xylol	26.0
Butanol	10.0
Solvesso 150	2.0
Capryl alcohol	2.0

Optimum viscosity for application by spray is 60 sec (No. 4 Ford Cup). Line spray pressure of 50 psi and feed cup pressure of 15 psi are recommended, but excellent patterns are formed when these pressures are decreased to 40 and 10 psi, respectively. Suggested schedule is 15 min air dry, followed by 15 min bake at 300°F.

It was found that the use of toluidine red, chrome orange and Prussian blue toning pastes had no effect on either the handling or physical properties of the finish. However, chrome orange and toluidine red-toned enamels produced smaller patterns than had normally been gained with straight aluminum pigmentation. Prussian blue had no effect on pattern size. Optimum dry film thickness was around 0.9 mils. A DeVilbiss spray gun with No. 30 air cap was used in the testing.

(Information furnished by Resinous Products Division of Rohm & Haas Company, Philadelphia, Pa.)

### Data for identification of molecular spectra

Designed to help make accurate identifications of molecular spectra in the wave length region from 10,000 to 2,000 Å, 276-page book contains photographs of band systems, tables of wave lengths, suggestions for use, and general information about band spectra.

Book is conveniently divided into 2 parts. First part lists strongest heads of the better-known band systems of each molecule, in order of wave length, together with information about their origin, intensity in various sources, and appearance. Second part includes individual lists of band heads. Appendix contains table of persistent lines of elements, and a number of plates showing common band systems.

To obtain "The Identification of Molecular Spectra", 2nd edition, remit \$8.50 direct to John Wiley & Sons, Inc., Dept. CP, 440 Fourth Ave., New York 16, N. Y. When inquiring specify CP 2948 on handy form, pages 2 and 3.

CHEMICAL PROCESSING

## MATERIALS

### Makes pipe connections safe at 2000 psi . . .

liquid seal makes pliable, tough gasket after application

**Uses:** Sealing of flanged or threaded pipe connections. Not dissolved or otherwise affected by oil, chlorine, sulfur dioxide, propane, butane, refrigerant gases, salt brine, ammonia, oxygen, alcohols, acids, alkalis, and most other chemicals and solvents.

**Features:** Provides a safe, leak-proof joint, even at pressures exceeding 2000 psi. Has high resistance to thermal shock, remaining elastic over wide range of temperatures. Keeps joint tight under severe vibration. However, joints can be taken apart without damage to threads or fittings, regardless of type of service or age of joints. Non-toxic.

**Description:** Cyl-Seal is a liquid emulsion of elastomers which changes in the joint to a tough, elastic solid. Although it contains no lead, graphite, oil or inflammable solvents, it provides a well-lubricated joint, thus preventing galling and seizing. The compound withstands decomposition in pure oxygen up to 230°C.

**Source:** Product of West Chester Chemical Company, Dept. CP, 309 S. Walnut St., West Chester, Pa. . . . or for information check CP 2949 on handy form, pages 2 and 3.

### Treats recent advances in colloid science

Volume III of "Advances in Colloid Science" covers a series of topics giving an approximate cross-section through the branches of colloid science that have grown rapidly or shown unexpected developments during the last few years.

Contents are best indicated by topic headings: 'Atomic Forces and Adsorption'; 'Surface Chemistry and Colloids'; 'Quantitative Interpretation of Electrophoretic Velocity of Colloids'; 'Lyogels'; 'Ultracentrifugal Sedimentation of Polymolecular Substances'; 'Fatigue Phenomena in High Polymers'; and 'Flotation'.

Published by Interscience Publishers, Inc., Dept. CP, 215 Fourth Ave., New York 3, N. Y. When inquiring specify CP 2950 on handy form, pages 2 and 3.

For more information on product at right, specify CP 2951 . . . see information request blank between pages 2-3.

FEBRUARY, 1951

## WITCO technical service answers the request "Information, Please"

Useful information, solidly based on experience and careful research, is the main product of Witco's Technical Service. From Witco's central laboratory in Chicago flows a steady stream of clear, concise reports, containing the solutions to numerous customer problems. Behind these reports, sifting and analyzing the data, is Witco's trained staff of research experts. Their combined talents represent a large pool of experience ready to go to work for you. Take advantage of this service. Write *today* for a list of Witco's Technical Service Reports.

Metallic Stearates  
Carbon Black  
Paint Driers  
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Witcote (Automobile Undercoating)  
M. R. (Hard Hydrocarbon)  
Stabilizers for Vinyl Resins



**WITCO CHEMICAL COMPANY • 295 MADISON AVE., NEW YORK 17, N. Y.**

Los Angeles • Boston • Chicago • Houston • Cleveland • San Francisco • Akron • London and Manchester, England

### Specifies organic chemicals

Eighty-six-page bulletin presents extensive data and general information on organic chemicals made available during 1950. List includes beta-substituted propionitriles, 3-substituted propylamines, dipropionitriles, 2-nitrodiphenylamine, 2-aminobenzenethiol, and sodium di-cyanamide. "Collective Volume II" is issued by New Product Development Dept., American Cyanamid Company, Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. When inquiring specify CP 2952 on handy form, pages 2 and 3.

### No hazing when lead drier is incorporated with oils, resins . . .

lead naphthenate's metal content standardized at  $24.0 \pm 0.1\%$  to assure consistent results

**Uses:** Drier for paint and varnish formulations.

**Features:** Product has a carefully standardized metal content ( $24.0 \pm 0.1\%$  lead metal) to assure incorporation of exact amounts of lead metal in formulations, as well as to assure consistent results. Light color offers low staining characteristics, and low viscosity has advantages of free flowing, easy handling properties. Stability assures safe storage and clarity. Readily compatible with oils and resinous vehicles.

Conventional lead driers in certain drying oils or resin vehicles tend to haze upon standing. Maker reports this drier is relatively resistant to this hazing. He further reports it gives faster drying with less after-tack in dehydrated cator oil varnishes than other lead driers.

**Description:** "24% Lead Naphthenate" has the following physical properties:

Metal, %	24.0 $\pm$ 0.1
Viscosity (Gardner-Holdt)	Less than A
Color (Gardner)	9
Non-volatile, %	61
Solvent	Mineral spirits
Lb/Gal	9.6
Flash Point (TCC), °F	100 min.

Lead drier is added to paints and varnishes in amounts ranging from 0.1 to 2% as metal, based on the drying oil or resin. Optimum amount varies with the vehicle involved and the combination of other driers present in the compound.

**Source:** "24% Lead Naphthenate" is a product of the Witco Chemical Company, Dept. CP, 295 Madison Ave., New York 17, N. Y. . . or for more information check CP 2953 on handy form, pages 2 and 3.

### Intense bitterness of chemical promotes use as precaution in toxic formulations . . .

sucrose octa acetate also used in adhesives, paper coatings, brake linings and plastics

**Uses:** As a bitter agent for use in denatured alcohol and in preparations for preventing thumb-sucking and nail-biting. Because of the material's intense bitterness and low order of toxicity, it should find application in poisonous household chemicals or toxic pills to prevent consumption by children.

Tackiness of the molten product suggests its use in anhydrous adhesive compositions or as a modifier of



## FOR YOUR INFORMATION

Every month Monsanto publishes these pages of pertinent information. Here you will find suggestions and application ideas selected to help you improve your products, lower your production costs, increase your sales. More information will be furnished on request.

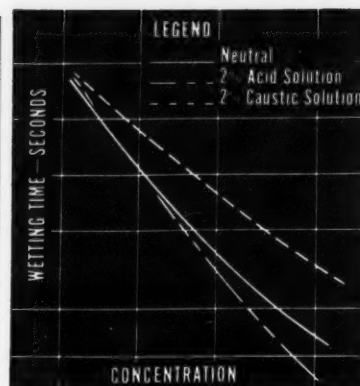
## Santomerse No. 1 serves many industries in numerous ways

Monsanto Santomerse® No. 1 is called the all-purpose detergent and wetting agent because it efficiently serves so many industries in operations requiring a cleaner, a wetter, a penetrant, an emulsifier, a dispersing agent.

Santomerse No. 1 is an alkyl aryl sulfonate compound having a minimum of 40 per cent active ingredient. It is effective in acid or alkaline solutions . . . in hard or soft water . . . at all required temperatures.

In addition to its extensive use as a general-purpose cleaner, Santomerse No. 1 has an important place in many operations. For example, it has proved itself extremely valuable in the acid bath for cleaning, treating or pickling metal. It increases the rate of acid action, aids in the removal of surface oils, thereby insuring uniform action of the acid, and gives a quick and more complete drain-off of the solution and objectionable residual salts.

For more details on the use of Santomerse No. 1 in this and numerous other industries,



Comparison of Santomerse No. 1 wetting action on neutral, acid and caustic solutions.

contact the nearest Monsanto Sales Office or mail the coupon for your free copy of the 20-page booklet, "Santomerse No. 1 All-purpose wetting agent and detergent."

## Aroclors give paints endurance to stand up under severe service

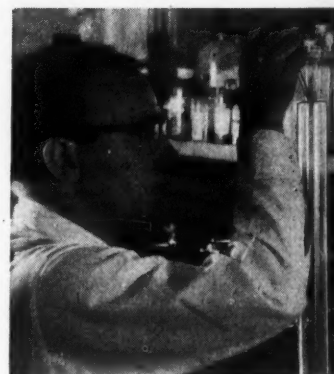
If you have a tough job for a maintenance paint, choose one that's formulated with an Aroclor.\*

Monsanto Aroclors (chlorinated biphenyls and chlorinated polyphenyls) make paints resistant to corrosion . . . give them superb adhesion . . . make them stable to light . . . give them tough, nonporous films.

The Aroclors are used extensively in rubber-base paints for stucco, masonry, steel and wood . . . in corrosion-resistant coatings for pipe lines, tanks and chemical plants . . . in fire-retardant coatings and in marine paints.

If you manufacture paints, we suggest that you investigate the use of Aroclors' product-improvement possibilities. Information is available without obligation from any Monsanto Sales Office or literature will be sent when requested by letter. In asking for literature, please tell us the use that you have in mind for Aroclors so we can send you information that will be of greatest service to you.

## AE-1 eliminates foam



THIS EXPERIMENT, conducted in Monsanto's Food Technology Laboratory, shows the effectiveness of AE-1, Monsanto defoaming agent. AE-1 may hold possibilities in the manufacture of yeast, textiles, adhesives, paints, steel and in other industries. If you have need for a defoamer, investigate AE-1. Mail the coupon or contact the nearest Monsanto Sales Office for details.

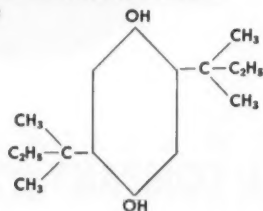
## Research Chemists' Corner

You may find something new here



If you are developing something new in chemicals . . . or if you're looking for something to replace a scarce material . . . look at the properties of Monsanto Di-tertiary-amyhydroquinone. You may find the answer to your problem. If, after reading the information here, you want to experiment with the material, contact the nearest Monsanto Sales Office or mail the coupon for a sample.

**DI-TERTIARY-AMYLHYDROQUINONE**  
**Structure:**



**Appearance:** White to buff powder.

**Specific Gravity:** 1.05 at 25° C.

**Melting Point:** 165° C. min.

**Solubility:** Very soluble in acetone, soluble in ethyl acetate.

**Moisture:** 0.5% max.

**Ash:** 0.5% max.

**Reactions:** Very weakly acidic and only partial reaction with aqueous sodium hydroxide.

Sodium salt may be formed by reaction with sodium metal in liquid ammonia.

Chlorine and bromine may be introduced into the ring.

## 375 to 500 times as sweet as sugar...and without calories!

Saccharin Monsanto adds sweetness without calories. It will not ferment or mold and it is nonirritating and nonpoisonous. That's why Saccharin Monsanto is called "the perfect sweetener."

Saccharin soluble granular is 375 times as sweet as sugar, and saccharin soluble powder (anhydrous) has 425 times sugar's sweetening power. On the basis of sweetening, saccharin at \$2 a pound is cheaper than sugar at 9¢ a pound.

When Monsanto was founded in 1901, its first product was saccharin. Today, Monsanto manufactures more saccharin than any other company in America.

Monsanto produces saccharin in these forms:

**Saccharin Insoluble Powder**—White crystalline powder (approximately 100 mesh); loss on drying, 0.5% maximum; melting point, 227.0° C. minimum to start; purity, 98.0% minimum.

**Saccharin Sodium Soluble Powder, U.S.P.**—Fine white powder (approximately 140 mesh); loss on drying at 125° C., 5.8% maximum; solubility in water, 1:8 complete.

**Saccharin Sodium Granular, U.S.P.**—Fine white crystals (approximately 10 mesh); loss on drying at 125° C., 14.35% maximum; solubility in water, 1:8 clear.

The principal uses of saccharin are in flavoring beverages, pharmaceuticals, foods, mouth washes, dentifrices and tobacco. It is substituted for sugar in diabetic foods.



Monsanto offers two interesting pieces of literature on the product: "Saccharin—The Perfect Sweetener" and "The Sweetest Story Ever Told." The latter booklet contains recipes for many delicious desserts in which saccharin is used as the sweetener. Copies of this literature will be sent free upon request. The coupon is for your convenience.

SEND INFORMATION: ☐ AE-1. ☐ 2,4,5-T.  
☐ The Aclors for \_\_\_\_\_

SEND LITERATURE: ☐ "Saccharin—The Perfect Sweetener." ☐ "The Sweetest Story Ever Told." ☐ Intermediates Catalog. ☐ Booklet, "Santomerse No. 1."

SEND SAMPLE: ☐ Di-tertiary-  
amylhydroquinone.

## Honey mesquite meets its match in Monsanto 2,4,5-T

Honey mesquite, infesting millions of acres of rangeland, has met its master in a Monsanto herbicidal chemical, 2,4,5-Trichlorophenoxyacetic Acid. On some future day, when enough 2,4,5-T and spraying equipment are available, mesquite can become a memory . . . no longer hiding cattle gone wild . . . no longer crowding grass from grazing land . . . no longer plaguing cowboys with its thorns.

The effectiveness of 2,4,5-T in controlling honey mesquite has been proved in experiments in Texas over a three-year period.

While thousands of chemicals have been tested, 2,4,5-T appears to be the only material that is satisfactory on all points for large-scale applications. Based on its results, one of those conducting the experiment says, in part:

" . . . it appears that mesquite may be controlled by the application of  $\frac{3}{8}$  pound of a low-volatile ester of 2,4,5-T in 1 gallon of diesel oil and 3 gallons of water."

The herbicide should be applied by an experienced man, properly equipped, during springtime when mesquite is in full leaf and making rapid growth. It appears that control will be effective for from five to ten years at an economical cost.

The present demand for Monsanto 2,4,5-T Acid exceeds the supply. However, research on 2,4,5-T and other herbicidal and insecticidal chemicals continues unabated.

## Ortho-NITROBIPHENYL, plasticizer and intermediate, price reduced

If you are having difficulty in getting plasticizers, or if you need an efficient intermediate that is available, investigate Monsanto's ortho-nitrobiphenyl, technical (also known as ortho-nitrodiphenyl). A recent price reduction makes ortho-nitrobiphenyl more economical than ever.

Details on ortho-nitrobiphenyl and on other intermediates are contained in Monsanto's intermediates catalog which is just off the press. You may obtain a copy by contacting the nearest Monsanto Sales Office or by requesting one on the coupon.

**Intermediates now available**—Monsanto Salt (Sodium ortho-chloro-para-toluenesulfonate). Ortho-Aminobiphenyl. Ortho-Nitrobiphenyl. Toluenesulfonic Acid.



Typical honey mesquite in pasture,  
Pitchfork Ranch, Spur, Texas.



The same field after the application of  
Monsanto 2,4,5-T ester.

*Intermediates which may or may not be available*—Benzyl Chloride. Benzoic Acid, Technical. Cyclohexylamine. Dicyclohexylamine. Dinitroaniline. Dinitrochlorobenzene. Meta-Chloroaniline. Meta-Nitrochlorobenzene. Ortho-Nitrochloroaniline. Ortho-Anisidine. Ortho-Phenetidine. Para-Anisidine. Para-Phenetidine. Para-Chloroaniline. Salicylic Acid, Technical. Thiourea.

• • • • •

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## MATERIALS

other adhesive preparations. Its properties may be modified by the addition of selected pigments, plasticizers or solvents.

The material has been employed in making a brake lining with lowered moisture absorption. It can be introduced, in powdered form, as a distinct component of the mix.

A transparent sheet having a parchment-like surface is obtained when a high-grade paper is impregnated with a solution of sucrose octa acetate in a volatile solvent.

Similar solutions on heavier stocks leave the surfaces resistant to oil, water and grease. The excellent electrical properties of sucrose octa acetate should be of interest to manufacturers of insulating papers.

The material may be used in formulation of cellulose nitrate and cellulose acetate lacquers and for modifying the properties of synthetic resins and plastics.

**Features:** Although derived from cane sugar, sucrose octa acetate has an intensely bitter taste — so much so that 1 part in 100,000 parts of water can be detected readily. The material is non-hygroscopic. It is practically insoluble in water, but dissolves in most organic solvents except straight-chain hydrocarbons and glycerol.

**Description:** SOA brand sucrose octa acetate is a white crystalline product. The pure material melts at 89° C and boils at 260° C (0.1 mm Hg). It decomposes at temperatures above 285° C. Specifications of two grades are as follows:

	TECHNICAL	CP
Sucrose Octa Acetate, Min.	99.0%	99.4%
Free Acidity as HAC, Max.	0.10%	0.04%
Melting Point, °C	78-84	81-84
Insolubles (in Alcohol), Max.	0.1%	0.01%
Color of Crystals	Creamy White	White

Sucrose octa acetate undergoes the usual reactions typical of esters, such as saponification. Although it is a sugar derivative, it does not reduce Fehling's solution. It does not hydrolyze.

**Source:** Product of Niacet Chemicals Division, United States Vanadium Corporation, Unit of Union Carbide and Carbon Corporation, Dept. CP, 910 Niagara Bldg., Niagara Falls, N. Y. . . or for more information check CP 2955 on handy form, pages 2 and 3.

## Slide chart gives data on stainless steel

Technical data and information on the workability of stainless steels are presented in convenient form by a chart that operates on slide rule principle. Chart includes standard analysis table of stainless steels, together with their corresponding AISI type numbers, and gives relative fabricating data on the steels for a variety of operations. These include soldering, welding, roll forming, hot and cold riveting, forging, buffing, deep drawing, blanking, and perforating. Machinability, measured by a range of low and high speeds of turning in surface feet per minute, is also given.

Slide chart gives information on corrosion resistance, Brinell and Rockwell hardness ranges after drawing, tensile strength, elongation, scaling temperatures safe for continuous service, and whether steel is subject to intergranular corrosion. Forms in which stainless steel is available are also listed. Stainless Steel Slide Chart is issued by The Carpenter Steel Company, Dept. CP, Reading, Pa. When inquiring specify CP 2956 on handy form, pages 2 and 3.

When inquiring check CP 2954 on handy form, pgs. 2-3

**non-toxic, non-volatile, non-corrosive**

**gluconic acid**

**is the choice as an acid catalyst**

Non-toxic, non-volatile, non-corrosive gluconic acid is being used with increasing frequency as an acid catalyst for vat soluble ester printing pastes. Formulations made with gluconic acid are more stable than those made with other organic acids, a factor of real importance when breakdowns occur. Moreover, such pastes yield bright, clear colors without tendering of the fabric. In alkaline solutions, gluconic acid offers the additional advantage of efficient sequestering action, giving protection against trace metals which may cause dulling of colors.

Many of the same outstanding characteristics which make gluconic acid so effective as an acid catalyst in printing pastes also apply to its derivative — glucono-delta-lactone, the anhydride of the acid. This white, odorless, free-flowing powder is stable in air and of a high degree of purity. Glucono-delta-lactone is the acid catalyst of choice for acid colloid resins because:

1. Afterwash can be eliminated.
2. It gives better "hand".
3. It is easy to handle in production.
4. Contains no water — reduces shipping, storage and handling.

Write today for samples and prices of both products. Detailed information available in Technical Bulletin #6 and #33.

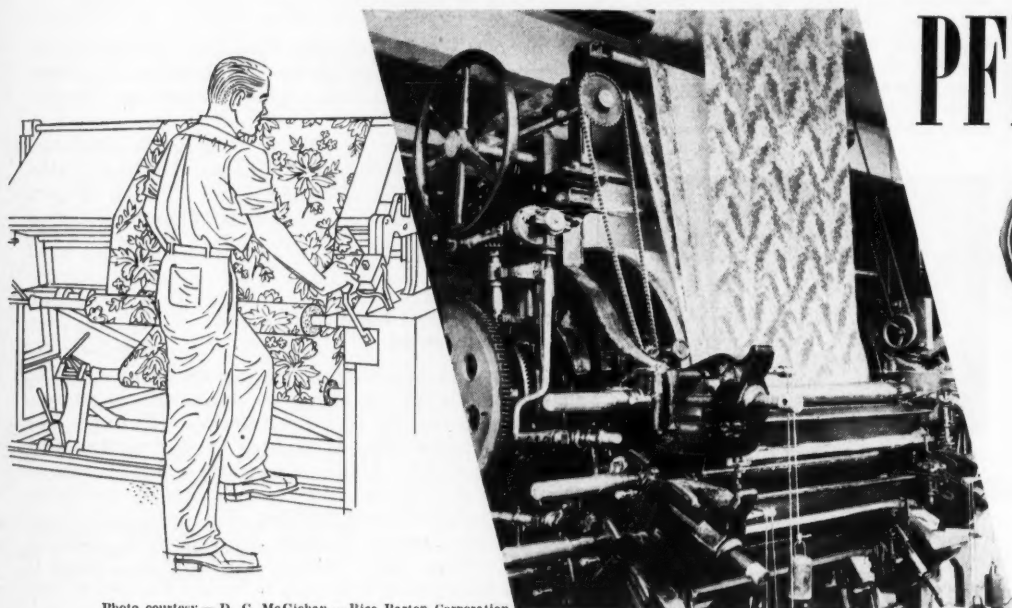


Photo courtesy — D. C. McGiehan — Rice Barton Corporation.

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AMMONIUM GLUCONATE • CALCIUM GLUCONATE • COPPER GLUCONATE • FERROUS GLUCONATE • GLUCONO-DELTA-LACTONE  
MAGNESIUM GLUCONATE • MANGANESE GLUCONATE • POTASSIUM GLUCONATE • SODIUM GLUCONATE

CHAS. PFIZER & CO., INC., 630 Flushing Ave., Brooklyn 6, N. Y. • 425 North Michigan Ave., Chicago 11, Ill. • 605 Third St., San Francisco 7, Calif.

When inquiring check CP 2957 on handy form, pgs. 2-3

## MATERIALS

**Offers two alkyd solutions for paints, finishes . . .**

one promotes color retention, drying, weather and water resistance; other lends toughness

**Uses:** No. 7300 glyptal resin solution has suggested uses in architectural finishes, porch and deck painting, trim colors, structural primers and finishes, traffic zone paints, and lithographic coatings.

No. 7310 glyptal resin solution may be used as a vehicle on a wide variety of metal products such as automotive equipment, farm machinery, cabinets, kitchen appliances.

**Features:** No. 7300 is recommended where the primary requisites are color retention, drying qualities, and water and weather resistance.

No. 7310 is designed to give increased color retention and toughness on bake-out.

**Description:** First is a medium length drying oil alkyd solution; second is a short drying oil baking alkyd solution. Both oils are oxidizing type, and resins both

### CONSTANTS OF SOLUTION

	7300	7310
Solids by weight, %	49-51	49-51
Solvent	Pet. Spts.	Arom.
Viscosity, G-H	Z <sub>1</sub> -Z <sub>2</sub>	X-Z
Lb per gallon	7.6	8.2
Aliphatic solvent tol.	Excellent	Fair
Oil miscibility	Good	Fair
Pigment compatibility	Excellent	Excellent
Solids at C-E viscosity	41%	39%

### FILM PROPERTIES

Air dry—set	Medium	Slow
Air dry—hard	Medium	Slow
Through dry	Excellent	Excellent
Baking speed	Medium	Fast
Hardness	Good	Very Good
Flexibility	Excellent	Very Good
Gloss	Good	Good
Color retention—air dry	Excellent	Excellent
Color retention—bake	Good	Good
Water resistance	Excellent	Very Good
Oil & gasoline resist.	Excellent	Excellent
Weather resistance	Excellent	Excellent

### RESIN SOLIDS CONSTANTS

Specific gravity	1.08	1.13
Lb per gallon	9.0	9.4

have some phthalic anhydride present. Color of both solutions is 7 max on the Gardner scale, acid number is 3 to 5, and flash point is 100°F. Other constants and properties are summarized in tabular form.

Optimum drier recommendation with 7300 is 0.04 to 0.06% cobalt, 0.04 to 0.06% calcium, and 0.1 to 0.2% lead. When 7310 is used as a bake finish, 0.03% cobalt is recommended.

**Source:** Products of Chemical Department, General Electric Company, Dept. CP, 1 Plastics Ave., Pittsfield, Mass. . . . or for more information check CP 2958 on handy form, pages 2 and 3.

**Gives basic information on ammonium nitrate**

Proper methods of handling, storage, and use of ammonium nitrate fertilizer are described in 24-page illustrated

CHEMICAL PROCESSING

booklet. Fire and explosion hazards are covered in detail. Properties, transportation regulations, and bibliography are also included. To obtain "Fertilizer-Grade Ammonium Nitrate", remit 50c direct to Manufacturing Chemists' Association, Inc., Dept. CP, 246 Woodward Bldg., Washington 5, D. C. When inquiring specify CP 2959 on handy form, pages 2 and 3.

### Versatility of polyester resins is their big feature . . .

properties range from rigid brittleness to flexibility, but all are thermosetting

Polyester resins are the only thermosetting materials which have a range of properties extending from a highly rigid, brittle type resin to flexible materials which are similar in some respects to vinyl compounds. All of the resin reacts without the necessity of removing solvent and, at the same time, the resins are available in a wide range of viscosities. Special types are produced for fire resistance; in some cases, crystalline wax-like resins are available for use as hot melts.

Chemically, the resin consists of an unsaturated polyester alkyl dissolved in a cross-linking agent which copolymerizes by the use of heat and catalysts. Benzoyl peroxide is usually the catalyst, and styrene or diallyl phthalate the cross-linking agent.

The cured resins resist solvents and chemicals. They have heat distortion points but do not melt as thermoplastics do. They do not show cold flow, nor do they become unusually brittle at low temperatures. The electric properties are excellent. However, there are two problems involved in their use. They all show shrinkage in passing from the liquid, monomeric stage to the rigid, cured condition. This may cause strains and even cracking in large sections.

Another important consideration is control of the exothermic reaction to prevent the resins from reacting so vigorously that the quality of the plastic part is damaged. Mass of the resin, concentration of catalyst, temperature of cure and various other matters must be given consideration in this connection.

Although benzoyl peroxide is the usual catalyst, a newly developed technique for the use of a room temperature catalyst, such as Lupersol DOM, has opened up new fields in many applications. Different catalysts can be used for different cure behavior. Concentrations of catalyst are usually from 1/2 to 2% (benzoyl peroxide). Molding temperatures are generally 200 to 250°F. For large pieces or sections, it is often very desirable to lower the curing temperature to 180 or 190°F.

At present, the largest volume and use of polyester resins is in connection with fibre glass reinforcement. While some work is still going on with glass cloth, glass mat has in general replaced it for most uses. The plastic parts from this process, called mat moldings, are made by two general processes. One involves the use of contact pressure with cure taking place at room temperature or low temperatures. The other involves use of matched metal molds at higher pressures. Such things as boat hulls, tote boxes, trays, instrument cases, skylight panels, housings for vaporizers, sterilizers, lamp shades and mannequins are examples of materials now being produced from polyester and glass mat.

(Taken from talk given by Dr. J. D. Robinson of American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N. Y.)

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# SURFACTANT

... oil and water,  
powders and liquids,  
many unmixables ...  
do mix!

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**may make your product easier to sell**

Many "unmixable" combinations are readily combined—to form stable and uniform fluids, emulsions, lotions, creams or sprays—with the help of a **SURFACE ACTIVE AGENT**. The new, or improved products, act more quickly—more thoroughly—or for a longer period of time. They are thus easier to sell; they frequently cost less to make.

Some thirty industries—including the agricultural, insecticide, rubber, petroleum and textile

fields—have profitable uses for Antara surfactants.

Extensive research staffs and facilities support the development and application of Antara surfactants—available to help you improve an existing product or develop a new one. Your inquiry is invited—without obligation. It will bring a prompt opinion as to whether one of the Antara surfactants may be adaptable to your needs. Kindly address your inquiry to Department 28.

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When inquiring check CP 2960 on handy form, pgs. 2-3

# Tallow Being Decolorized by Liquid-liquid Extraction with Propane

**Plant handles more than 200,000 lb/day in process that is more effective than old bleaching methods**

**L**EVER Brothers Company plant in Baltimore, Md., is decolorizing tallow by liquid-liquid extraction with propane. The processing unit was designed and erected by M.W. Kellogg Company and has a capacity of more than 200,000 pounds per day. The process has been found to be much more effective than those using bleaching earths and chemical bleaches.

Basically, the process is very simple. Tallow and propane are pumped into a fractionating tower in the correct proportions (15 volumes of propane to 1 of tallow), and the mixture is subjected to proper conditions of temperature and pressure. Color bodies are removed from the bottom and decolorized tallow in propane solution leaves at the top. Propane and tallow fractions are separated and recovered by flash drums, strippers and other accessory equipment. Finished product yields are approximately 98% of the crude feed.

Crude settled tallow is weighed in one of two scale tanks and pumped to tower through a preheater which raises its temperature to about 159°F. Its pressure at entrance to tower is 475-480 psi. The weigh tanks are operated alternately so tallow feed to the tower is continuous. Feed temperature and flow are automatically controlled.

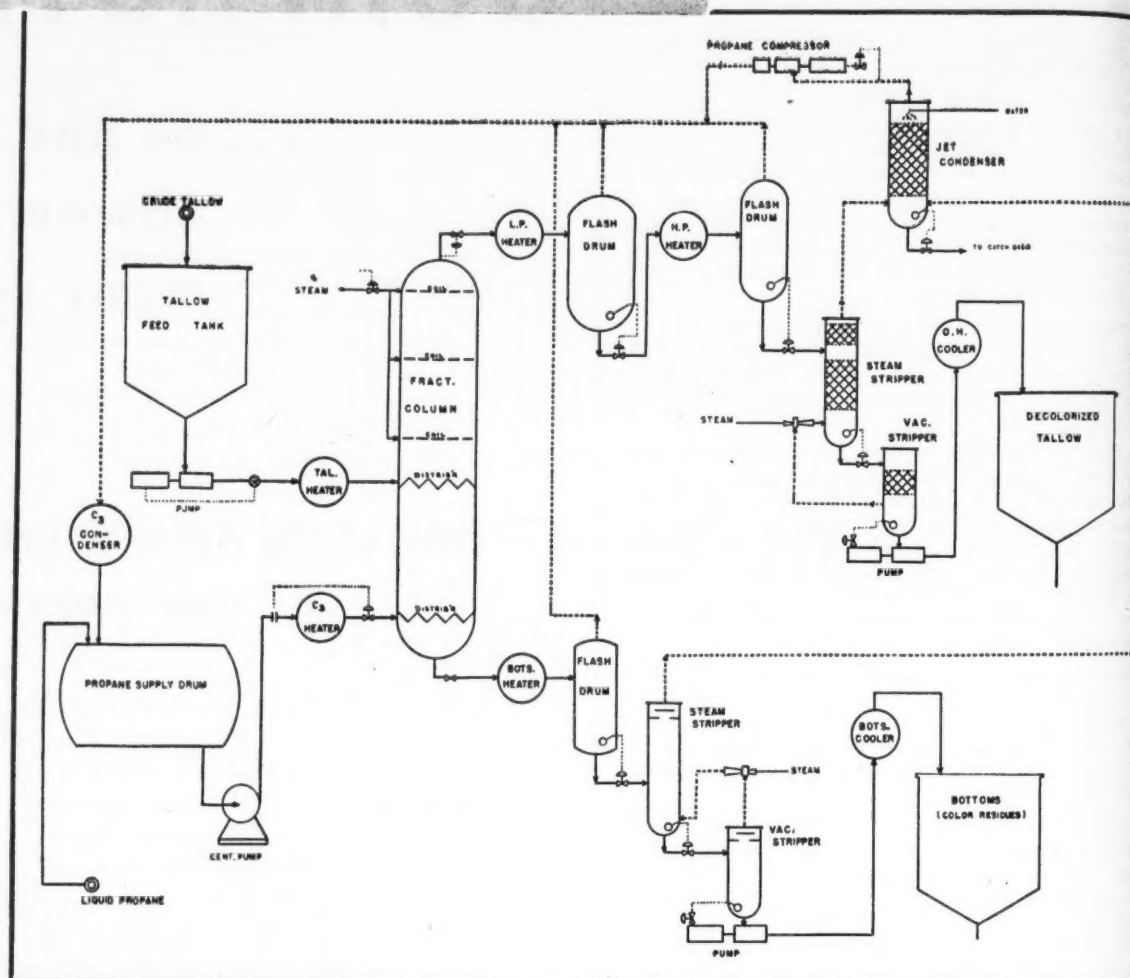
Propane is supplied from a working tank in which it is held at about 270 psig and 120°F. It is pumped, at a pressure of about 570 psig, through a preheater, where its temperature is raised to about 158°F before it enters the tower. Temperature and flow are automatically controlled.

The fractionating tower is 39'6" tall and 5'6" internal diameter. Internal heating coils, baffles, supports, etc., are 316 stainless steel. Inside surface of tower shell is 316 stainless-clad steel. There are 16 slot-type baffles in the column, as well as a group of 3 temperature control steam coils in the upper section. A definite temperature gradient is closely maintained in the tower. Pressure is controlled at about 465 psi.

Overheads solution enters a low pressure steam heater where the temperature is controlled at approximately 167°F. Then, about 95% of the propane is flashed off in the first overheads flash drum in which the pressure is about 275 psig and is controlled by the pressure in the propane supply tank to which the drum is connected (through the propane condenser).

Bottoms of the drum are passed to high-pressure steam heater, through float level control, where the temperature is raised to about 260°F. Practically all the remaining propane is removed in the second flash drum. This drum is also at about 275 psi, since it too is connected to the propane condenser and supply tank.

The slight amount of propane left in the oil is recovered by withdrawing the oil through a level controller at the



Flow diagram of tallow decolorization process

bottom of the flash drum into the overheads stripper system where the propane flashes off at a pressure of about 5 psig. Both the steam stripper and vacuum stripper are packed. Steam from the ejector for the vacuum stripper is used in the steam stripper. Liquid level control is used for regulating flow between strippers.

Depropanized tallow is pumped (pumping rate controlled by level controller) through tubular coolers and to aluminum finished product tank. It enters the tank at approximately 120°F.

Precipitated bottoms, or color bodies, are passed through a tubular heater where the temperature is raised to about 260°F. Partial vaporization occurs in the heater, and the vapor, together with the residual liquid, flashes into the bottoms flash drum where most of the propane is separated.

Bottoms flow under level control through a high-temper-

ature heater (not shown in flow diagram) where water is evaporated. Then they go through a stripping system similar to that used for the overheads except that packed columns are not used because of the rather viscous nature of the bottoms at this point. Instead, a tangential feed and a disc-and-doughnut baffle arrangement are employed. The baffles minimize entrainment.

From the vacuum stripper, the bottoms are pumped through a tubular cooler, where temperature is reduced to about 150°F, and thence to a steel scale tank. Pumping rate is regulated by level controller in vacuum stripper.

## Propane recovery system

High-pressure propane vapors from the overheads flash drums flow directly to the propane condenser. Condensed

propane at 118-120°F is returned to the working supply tank. The high-pressure propane from the bottoms flash drum goes through an entrainment separator and directly to the working supply tank. In the flow diagram, this propane is shown as also going through the propane condenser, but such is not the case. The exposed interior surface of the propane drum serves to condense the relatively small amount of propane vapors given off from the bottoms.

Low-pressure propane and steam vapors from both stripper systems are sent through a packed jet condenser where the vapors are cooled to about 80°F by direct contact with water. Propane vapor from the jet condenser is compressed and sent back to the propane working supply tank.

Safety devices eliminate the danger of water overflowing into the propane compressor if the jet condenser packing should clog. Other devices prevent tallow and propane from blowing through the overheads or bottoms product pumps in the event of pressure build-up in the vacuum strippers.

#### Purging on non-condensables

Not shown in the diagram is the system for purging the propane of non-condensables, small amounts of ethane and other light hydrocarbon gases. To purge without losing too much propane, a purge gas cooler has been provided at the top of the propane supply tank. Liquid propane is expanded through the tubes of this condenser, creating temperatures as low as -40°F.

The expanded gas is recycled through the jet condenser to the compressor, propane condenser and back to the supply tank. Propane vapor, along with the undesirable gases, is discharged under manual control through the shell side of the purge cooler, where most of the propane will recondense and flow back to storage while the non-condensables are vented to a blow-down stack. This stack can be used for venting the propane in an emergency.

#### Effect of process variables

The useful temperature range for decolorization lies between 150 and 170°F. Tower temperatures are extremely important, particularly the top tower temperature. Variations of a few tenths of a degree will often change the color of overheads substantially. The top temperature also exerts a strong effect on the amount and composition of the bottoms product. The solubility of tallow in propane decreases as tower temperatures are increased. A typical temperature gradient in the tower might be about 4°F.

Better overheads colors are obtainable with high solvent ratios than with low solvent ratios. When ratios are changed, the temperature conditions must also be changed. The temperature adjustment increases with increasing ratios and, in the range between 10:1 and 30:1, is of the order of 3°F change for every five-unit volume change in propane ratio.

Changing of column pressure exerts a change in the decolorization process. Increased pressure results in increased solubility of the oil, and higher temperatures are required to precipitate the color bodies. It is therefore important that the pressure be maintained constant, otherwise results are erratic. This has been easy in practice.

Use of overheads reflux was investigated, but found to have no appreciable benefit.

Composition of oil being decolorized has an effect upon temperature conditions required. Generally speaking, as the FFA content increases, an increase in tower temperature is required because fatty acids are much more soluble in propane than are the corresponding glycerides. This change in temperature is about 0.4°F per every 1% increase in FFA.

(Continued on page 41)

FEBRUARY, 1951

**SUPER-7 A AND B BELTS**  
Strong Cord structure impregnated with live rubber.

**SUPER-7 C, D, AND E BELTS**  
Famous grommet construction. No splices where failure can start.

**PRECISION MOLDED** — Every belt is accurately proportioned and molded to run smooth, cool and true.

**SHOCK RESISTANT** — Resilient cushion of rubber, acts as shock absorber, protects cord from stresses.

**TEXROPE**  
Greatest Name in V-Belt Drives

**POWERFUL** — Cords are of rayon, firmly twisted, accurately placed, impregnated with rubber to minimize friction.

## Cool Running... LONG LIVED!

**SUPER-7** V-belts give long, satisfactory service even under bad conditions of load, shock and grit.

Tough, double-wrapped cover bias cut for elasticity and impregnated with rubber. Effectively seals out dust, grit, moisture; takes the wear; keeps the belt in shape; and protects cord structure.

But you get more than good belts when you standardize on *Super-7* V-belts. You also get the benefit of the greatest V-belt experience in the world both in the field and factory. You are assured of exactly the right drive for longest life from the wide variety of types and sizes available.

#### High Capacity Belts

Where space is limited or other special

conditions demand heavier duty, the high capacity belt can be furnished in A, B, C, D, and E sections . . . Extra strong cords, special rubber cushion and tough Neoprene cover give them 40% greater capacity than standard belts at proportionately higher price.

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When inquiring check CP 2961 on handy form, pgs. 2-3

**Four new pH standards set by NBS clarify scale ends . . .**

extend accuracy of standard scales at high and low ranges

Four new pH standards, intended to provide fixed points at upper and lower ends of standard pH scale, have been selected by NBS. Solutions extend accuracy of standard scales made to conform with the 3 middle-range standards which the Bureau now distributes to the chemical industry.

Measurements of the degree of acidity and alkalinity play an important part in the research lab and in the regulation of such modern industrial processes as the manufacture of paper, textiles, and dyes. These measurements are expressed in terms of hydrogen-ion concentration, or pH, on a scale ranging from a pH of almost zero (very high acidity) to a value near 14 (very high alkalinity).

Although exact measurements of acidity can be made with instruments now in use, there has been a lack of uniformity among the results obtained because of the variety of definitions of the pH unit popular among chemists and the consequent difference in methods of calibration.

To encourage the adoption of a universally accepted scale of acidity, the NBS has for several years been distributing 3 samples of known pH. These fix the scale at pH 4, 7, and 9, and the pH of intermediate points is obtained by interpolation. Unfortunately, this scale is not at all uniform at its ends, and additional standards are needed to reduce the error of measurement at low and high pH.

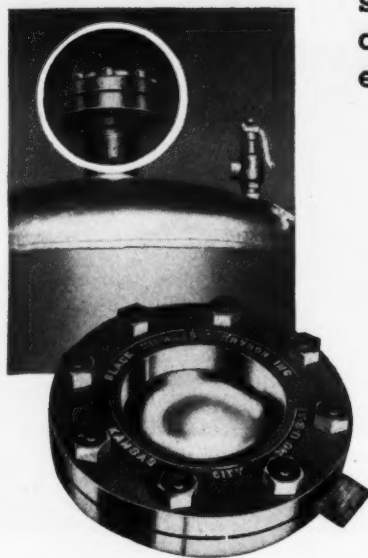
Recently, members of the Bureau's physical chemistry lab estimated that instruments calibrated by intermediate solutions will usually yield results that are in error by  $\pm 0.02$  to 0.05 unit.

In the course of the work, 41 solutions of possible value were found. Out of those, the following 4 standards were selected: 1) a mixture of sodium bicarbonate and sodium carbonate, both at 0.025 molar solution, with a pH of about 10; 2) a 0.01 molar solution of trisodium phosphate, pH about 11.7; 3) a saturated solution of potassium hydrogen tartrate, pH about 3.6; and 4) a 0.01 molar solution of potassium tetroxalate, pH about 2.1.

Although the new standards lengthen the accurate portion of the scale in

# Problem: Venting a dangerously fast

## Solution: BS&B SAFETY HEADS



Should external fire exposure—a sudden excessive pressure generation—or an internal fire and chemical reaction get out of hand—would your existing relief valve meet such an emergency?

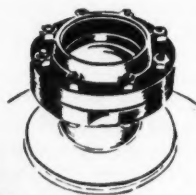
BS&B SAFETY HEADS are the solution for dangerously fast pressure rises. They give **INSTANT RELIEF!** A fully unrestricted opening is made for gases and liquids to escape. No other relief device acts as fast as the BS&B SAFETY HEAD.

There are three principal parts... a pre-formed metal rupture disc and two specially designed metal holding flanges. Correct element resistant metals are used in fabrication of the rupture disc which bursts when a predetermined pressure is reached. BS&B SAFETY HEADS are used the world over. There are no moving parts to wear or become fouled at a critical moment. SAFETY HEADS give 'round the clock protection to both property and personnel.

### Here Are the Answers to Your Relief Valve Problem — Ext

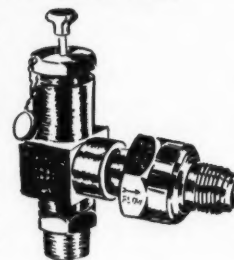
#### 1. As sole pressure relief device

This installation is used when it is not necessary to have a shut-off or when materials handled are not toxic or inflammable.



#### 2. At outlet of certain types of relief valves

A SAFETY HEAD at the relief outlet will stop leakage until rupture disc pressure is attained. Not recommended where viscous or corrosive materials might contaminate internal parts of the valve. Investigate your valve design before using this type of installation.



#### 3. Under your existing relief valve

A SAFETY HEAD under your relief valve isolates the valve from vessel contents. Leakage through the valve is eliminated until the SAFETY HEAD rupture disc is burst by over-pressure. An open bleed line or some type of tell-tale indicator must be installed in chamber between rupture disc and valve plug.

**BS&B**  
**SAFETY HEADS**

#### FREE ANALYSIS WITHOUT OBLIGATION

Jim Myers, BS&B SAFETY HEAD Sales Manager will have a BS&B engineer analyze your pressure relief problems and submit suggestions to you **WITHOUT COST OR OBLIGATION**. Mail the coupon on opposite page or call BEnton 7200, Kansas City. Do it now!

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fast pressure rise ...

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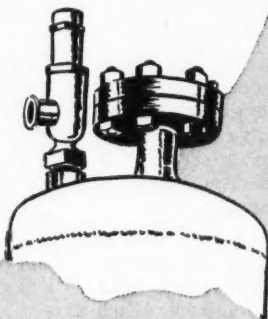
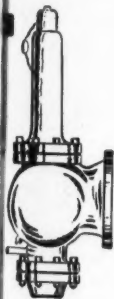
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Get all the facts ... all the answers to your questions about BS&B SAFETY HEADS! The latest up-to-the-minute information on the use of BS&B SAFETY HEADS in the Chemical Industry is contained in a new catalog. You will receive a copy by mailing the coupon below to Black, Sivalls & Bryson, Inc.

## Extra Protection for Expensive Equipment

### 4. As a secondary relief device

When the SAFETY HEAD is used as secondary relief device you are given positive protection when pressure rises to the predetermined bursting pressure of the rupture disc. The primary relief valve may fail to function due to corrosion, or if pressure continues to rise, due to inadequate relief area.



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Sales Promotion Dept., Section 4A-4-2, 7502 E. 12th St., Kansas City 3, Mo.

- ☐ Please send me a copy of the new BS&B SAFETY HEAD catalog. ☐ Please have a BS&B SAFETY HEAD engineer analyze my relief problem, without cost or obligation to me.

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## IDEAS

both directions, the measured pH of highly acid and alkaline solutions must still be assigned an uncertainty of at least  $\pm 0.003$  unit. (Summarized from information presented by National Bureau of Standards, U. S. Dept. of Commerce, Washington 25, D. C.)

### Foresee process for recovery of wood waste ...

test runs using 'fluidized carbonization' yield charcoal and various chemicals

Vast quantities of wood wastes are produced by lumber mills on the West Coast. More than half of every tree cut for processing is wasted; redwood sawdust alone is produced by the hundreds of tons each day.

This situation led Stanford Research Institute, Stanford, Calif., to work on a process for converting redwood sawdust into valuable materials by means of "fluidized carbonization", borrowing a technique familiar to petroleum refining.

The first experiments utilized a transparent column to determine such physical properties of the fluidized system as gas velocity, particle size range and distribution, and the behavior of the fluid bed. These runs were followed by batch carbonization tests using steel pilot plant equipment and various reaction temperatures. Destructive distillation of the redwood sawdust was successfully achieved, yielding charcoal and a variety of chemicals.

The Institute's experimental work culminated in continuous runs in which sawdust was constantly fed into the fluidizing unit and the products of the distillation were constantly removed. On the basis of these findings, a continuous, large-scale process has been visualized.

### Corrosion-resistant paints withstand 3-year test on hopper and tank cars ...

also withstand scrubbing with strong cleaning solutions

Finishes based on Vinylite resins are described as forestalling corrosive action on hopper cars many times longer than the conventional types. In addition to resisting corrosive effects of acids, soda ash and salt, the finish withstands strong washing solutions. Also, it is abrasion resistant. Chlorinated hydrocarbons soften it to some extent but if no abrasion occurs, film hardens when allowed to dry.

Test cars painted with this Vinylite resin based finish have carried punishing cargoes such as cement and soda ash for three years. They have remained almost corrosion free, even where sledge hammers have been used to break cargo loose. (Sherwin-Williams Co., Cleveland, O., is producing these finishes based on Vinylite resins from Bakelite Div., Union Carbide & Carbon Corp., New York 17, N. Y.)

For more information on product at left, specify CP 2962 ... see information request blank between pages 2-3.

## INTRODUCING A NEW PUBLICATION ON THE SUBJECT YOU WANT TO KNOW MORE ABOUT



Here is the first issue of a new technical magazine devoted to the science of humidity engineering and its various applications to comfort and industrial manufacturing problems. Published by Surface Combustion Corporation of Toledo, "The Humidity Engineer" contains comprehensive articles on the utilization of humidity control as well as discussions of the new engineering developments employing humidity control equipment in the chemical, food processing and other fields. You can receive this publication gratis by simply filling out and attaching the coupon below to your company letterhead.

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When inquiring check CP 2963  
on handy form, pgs. 2-3

# Extra fast, easy pipe cutting with



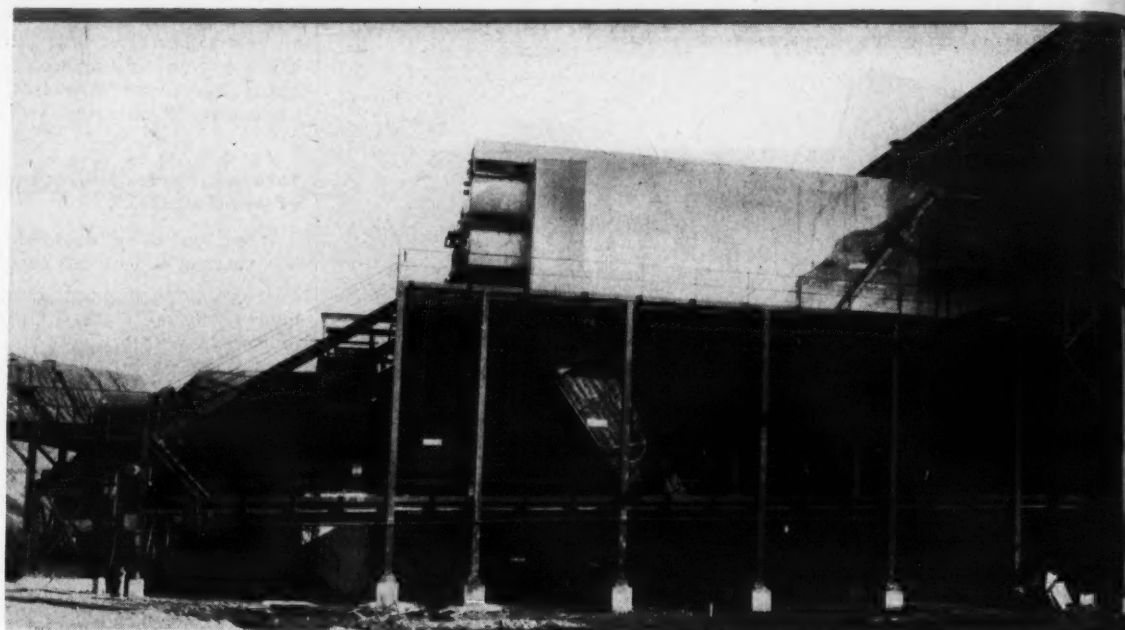
● It rolls right through any pipe with least effort, quick almost burrless cuts—factory tested, tracks perfectly. Special thin-blade cutter wheel for extra fast cutting—or heavy-duty wheel for extra long service. Guaranteed warp-proof special malleable housing. Five models to 6" pipe; 4-wheel short-handle models for speedy cutting in tight places. For tops in clean, easy pipe cutting, buy **RIDGID** Cutters at your Supply House.

## RIDGID

★ Work-Saver Pipe Tools ★

When inquiring check CP 2964 on handy form, pgs. 2-3

Page 40



This is one of seven large processing units that were insulated while at operating temperatures. Roaster is at top, carbonizer is under roaster, and furnace is at bottom

## Large Process Units Are Insulated While Hot to Avoid Cracking of Insulation by Expansion

**Technique is used by Disco Corporation on continuously operating carbonizers and roasters that produce smokeless fuel**

**T**HERMAL expansion, which so often produces cracks and splits in insulation, is not a problem on seven high-temperature carbonizers and roasters at the Disco Corporation, Imperial, Pa. Disco's engineers and insulation contractor insulated the metal surfaces of these continuously operating units at operating temperatures and, therefore, at maximum expansion.

The single processing unit illustrated is only one of seven which process a total of 1000 tons of coal per day to make the product, Disco, a smokeless fuel from which liquors, tar and gases have been removed. Each unit consists of a roaster, a carbonizer with rotating retort, and a furnace. The coal gases are cooled and scrubbed to remove tar and liquors, and are then burned in the furnace to produce hot, incombustible gases for heating the roasting and carbonizing processes. A hot-gas recirculating duct, insulated with mineral wool blankets, can be seen leading diagonally from the roaster on top to the furnace under the carbonizer.

The hot recirculated gases are heated in the furnace from 600 to 1050°F and enter the carbonizer. In the carbonizing process, the gas temperature drops to 900°F.

The gases then proceed to heat the roaster before recirculation to the furnace.

A total of 66,500 sq ft of surface was insulated on the seven processing units. Each carbonizer is 125' long and 9' ID. The roasters measure 6' x 95' x 16' each. Mineral wool blankets — 8" thick on the carbonizers and 4" thick on the roasters — allow only a few percent of the heat content (400 Btu per cu ft) of the scrubbed and treated by-product gases to be lost through radiation and convection from the insulated surfaces.

Insulation was applied to all units in 24 x 48" blanket sections. On each of the seven roasters, at an average temperature of 750°F, 5000 sq ft of surface area was insulated with a single layer of 4" blankets. Two 4" layers were applied to 4500 sq ft of surface of each of the seven carbonizers, at average temperature of 975°F. The blankets, sandwiched between metal lath and wire netting, were installed with netting against heated metal. The insulating blankets were secured by studs welded to the metal on 9" centers. Studs were 5" long for the 4" thick blankets, and 9" long for the 8". After all the blanket sections were impaled on the studs, galvanized

CHEMICAL PROCESSING

iron bands were tightly wrapped on 12" centers around the carbonizers and roasters to assure a long-lasting insulation cover.

A 1/2" thickness of mineral wool insulating cement was applied in two 1/4" layers over the blankets. The first layer was trowelled into the metal lath and, after it was completely dry, the second layer was trowelled over it. Then, sections of 1" wire mesh were stretched over the cement and laced together with 18-gage galvanized iron wire. The mesh covering was secured by staples driven into the cement by auto-clenchers on approximately 12" centers. As a finish, wet asphaltic mastic was trowelled into the mesh covering to provide a 1/8" dry thickness.

(Information courtesy of Industrial Mineral Wool Institute, 441 Lexington Ave., New York 17, N. Y.)

### **fewer coats, less thinner, increased coverage when spraying hot lacquers . . .**

lacquer application now brought into about the same cost range as applying synthetic enamels

Hot-lacquer process not only offers the finishing industry a means for by-passing the serious and ever-growing shortage of volatile ingredients, it also offers other substantial economies. These include all the advantages attained with cold lacquers, plus greater thickness per applied coat (due to higher solids content) and consequently fewer coats required, increased coverage per gallon, and speeded-up production cycles.

One user of hot lacquers reports that he now applies two coats and gets better coverage than when he formerly applied six coats of cold lacquer. In addition, he says he now uses 50 percent less thinner and has reduced rework to a bare minimum.

In the hot-lacquer process, heat is used instead of volatile ingredients to make the lacquer thin enough to spray. Spraying viscosity is achieved at approximately 160°F. Basically there is no difference in the quality of hot-sprayed and cold-sprayed lacquer finishes. Costs for applying lacquers by this process are now brought into about the same range as applying synthetic enamels.

Further details of the hot-lacquer process are available from the Hercules Powder Company, Dept. CP, Wilmington, Del. . . or for more information check CP 2965 on handy form, pages 2 and 3.

### **Tallow Decolorization** (Continued from page 37)

The process is most economical when run on a continuous basis. Four operating crews are needed, each consisting of a No. 1 operator, a No. 2 operator and a pump man. The No. 1 operator is in charge of all plant operations and is assisted by the No. 2 operator whose major functions are to watch instrument control operation and keep operating records.

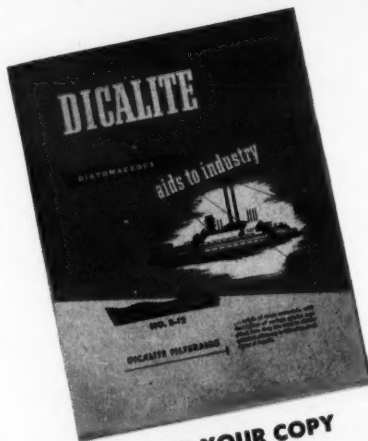
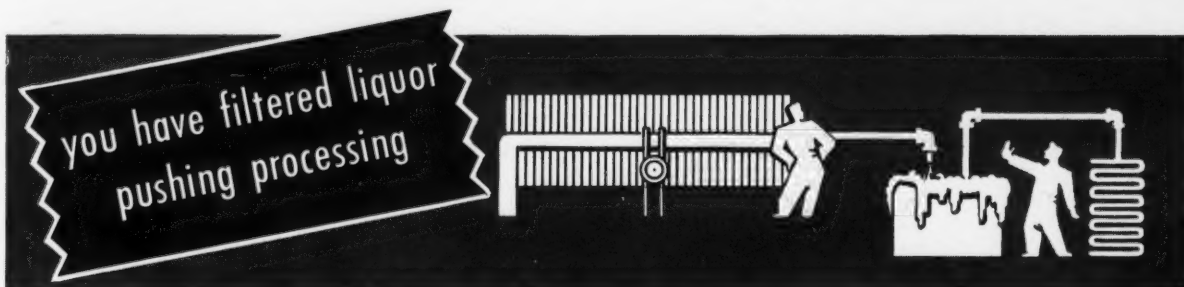
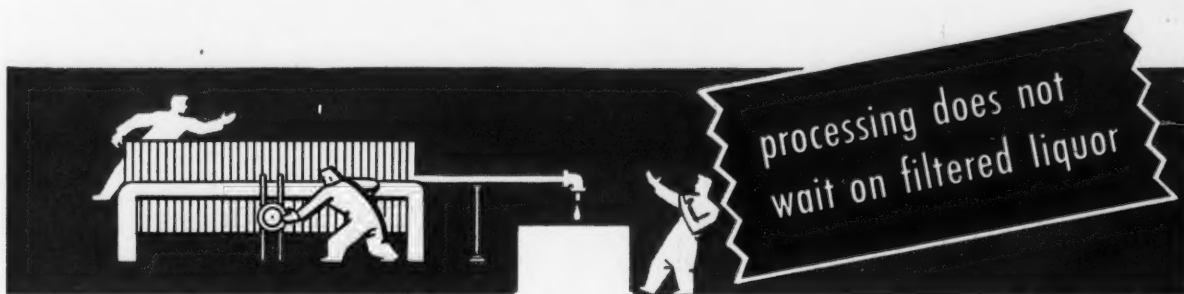
The pump man keeps feed tanks filled with crude stock and makes stock transfers as required. He also makes the hourly weight checks which are used to estimate operating efficiency.

In addition to these men, there are one plant supervisor and one man assigned to general housekeeping and utility work.

(Decolorizing equipment described in the above was furnished by the M. W. Kellogg Company, 223 Broadway, New York, N. Y.)

When using

# **DICALITE FILTERAIDS**



**SEND FOR YOUR COPY**  
Latest published information concerning use of diatomaceous filteraids. Covers fundamentals of filtration and describes best methods of use. Sent without charge on request.

• Production costs are again becoming extremely important. A filter station that lags behind the rest of the plant can increase costs all the way down the line. The range of flexibility available when using Dicalite filteraids prevents this. A wide variation in the filterability of liquids can be readily handled, and output maintained at the desired level. Because brilliant clarity is assured by the inherent qualities of Dicalite filteraids, every following operation benefits by cleaner, clearer liquors, that produce higher quality products at lower cost. Send for your copy of the latest Dicalite Bulletin on filtration—No. B-12. We will be glad to supply as many copies as you need for key men in your filtration department.

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## **DICALITE FILTERAIDS**

When inquiring check CP 2966 on handy form, pgs. 2-3



Making Tap Blades at Kuhns Bros.

## "K" on a fitting means accurate machining

Many of the tools for the machining of "K" Fittings are made in our own plant. We also design and build much of the special machinery required.

The machining of screwed fittings calls for extreme care and precision. Hundreds of taps have to be kept in first-class condition to chase threads full and clean. Fixtures have to be exact in order to maintain accurate alignment to agree with the angularity of fittings. Openings must be properly chamfered so pipes will enter easily—also to protect the outer threads.

Still more extensive machining is involved in the finishing of "K" flanged fittings. Here also dimensions must be held to close tolerances, and correct alignment maintained. Here also faces have to be accurately milled to make tight joints, and bolt holes properly spaced to speed make-up.

The accurate machining of "K" Fittings saves installation time, assures symmetry in the piping system, assures leakless connections.

Specify "K's" when you order fittings from your supplier.

### THE KUHNS BROTHERS COMPANY

1808 McCall Street  
Dayton 1, Ohio

Established 1887

### CAST-IRON FITTINGS

3,000 Shapes and Sizes

When inquiring check CP 2967 on handy form, pgs. 2-3

## IDEAS

### Each chemical process has its own hazards . . .

article presents some suggestions as to how they should be carried out safely

The more the chemical industry expands, the more need there is for a knowledge of the hazards presented by new products and processes. Safe use of chemicals depends on thorough knowledge of how each individual compound may act under a wide variety of conditions. Some of the chemical processes most frequently encountered and their hazards are outlined briefly here.

**Chlorination . . .** The corrosive action of reaction by-products such as hydrogen chloride or hydrochloric acid places specific restrictions on construction material of reaction equipment. Lead-lined or glass-lined reactors equipped with porcelain valves are commonly used. Resinous woods are also satisfactory if all hoops and tie rods are coated to ward off corrosion.

Since the chlorinated products of reaction are usually less flammable than the original hydrocarbon, no special hazard is created if the reaction goes too far. Principal hazards can be traced to the flammable hydrocarbon present, the possibility of leakage due to corrosion, and the escape of chlorine gas. Special care must be taken to eliminate all sources of ignition from the reaction area.

**Nitration . . .** Since this reaction generates an excessive amount of heat, an adequate cooling system must be supplied to avoid the danger of explosion. Danger of overheating makes continuous stirring a necessity, and propellers must be securely fastened to the drive shaft. Many plants have compressed air available at all times for emergency stirring. An added hazard is found in the toxic fumes produced.

**Sulfonation . . .** Provision must be made to control escape of flammable vapors from the reaction vessel. Adequate provisions must be taken for safe storage and handling of flammable liquids and sulfuric acid.

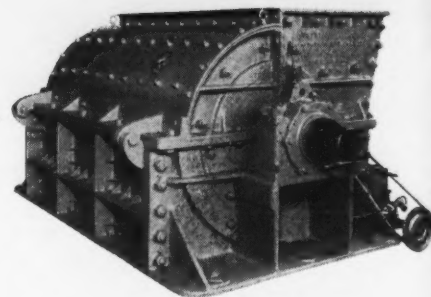
**Hydrogenation . . .** Reaction should take place in a closed converter equipped with heating and cooling coils and a stirrer. Failure to evacuate the system properly may result in formation of an explosive hydrogen-air mix-



The chemical plant should have plenty of fire extinguishers and men who know how to use the right type at the right time

ture. Some means of preventing overheating must be supplied. The most serious hazard is found in storage, manufacture and handling of hydrogen.

**Oxidation . . .** Procedures vary widely, depending upon the degree of oxidation required and the properties of the substance to be oxidized. An efficient means of dissipating liberated heat must be present to prevent complete oxidation to carbon dioxide and water. Reac-



## SHREDDERS for Industries who buy their raw materials loose or baled — Strips or Sheets

Typical raw materials handled with a Gruendler Shredder . . .

CORK  
BAGGASSE  
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SCRAP PAPER  
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AND MANY OTHER MATERIALS

Call on us, if you have a special material refining job to do.

Write for Bulletin 11 B.

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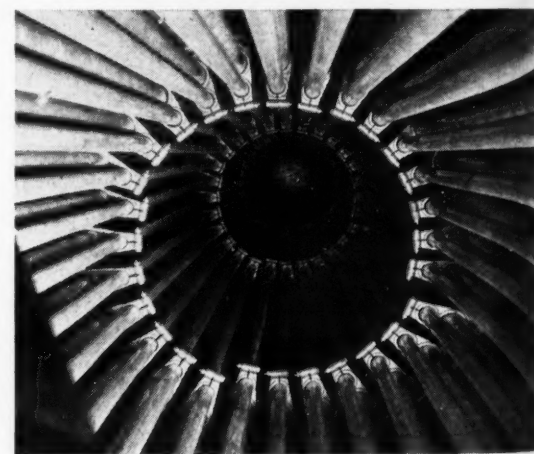
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LABORATORIES, 1911 North Market, St. Louis, Mo.

When inquiring check CP 2968 on handy form, pgs. 2-3



You are looking at the inside of a Ruggles-Coles Rotary Steam Tube Dryer — particularly adapted for removing moisture continuously from materials that are injured or chemically altered by high temperatures. It is a rotating, inclined cylinder with steam pipes attached to the inside of the shell, which also serve as lifting flights. Write for Bulletin 16 D-13.

## HARDINGE COMPANY, INCORPORATED

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When inquiring check CP 2969 on handy form, pgs. 2-3

tions must be so conducted that explosive peracids will not be formed in dangerous amounts. Care must be taken that the air-hydrogen vapors do not escape and ignite.

**Reduction . . .** Since this reaction is strongly exothermic, vigorous boiling may take place during iron addition and cause explosive pressure if the reflux condenser is not efficient for excessive rates of boiling. If the equipment is well-designed, this danger is not serious. Primary hazards relate to storage and handling of flammable liquids.

**Alkylation . . .** When reaction is conducted at high pressures, steel or enamel-lined autoclaves must be used. Autoclaves must be pressure-tested periodically and equipped with pressure-release valves. Valves should be inspected frequently for corrosion. Principal hazard is flammable nature of both reactants and finished product.

**Distillation . . .** A big cause of still fires is overheating due to human or automatic temperature control failure, permitting vapors to escape. Excessive internal pressure caused by clogging of apparatus has been responsible for many distillation explosions. Automatic equipment should be checked periodically; other apparatus should be inspected for air tightness and signs of weakening of still walls and piping, and all possible sources of ignition can be eliminated.

The Factory Insurance Association suggests the following safeguards in chemical processing:

1) Thorough small scale tests should be made of a process before it is transferred from the laboratory to full plant scale. Changes in grade of chemicals and construction materials may introduce some special hazard.

2) If process conditions are to be changed even slightly, the effect of the change should be proved by laboratory re-check as though the process were all new.

3) Periodic safety meetings should be held to review new processes and changes in old ones.

(Information courtesy of Fire Protection Institute, 670 Fifth Ave., New York 19, N. Y.)

#### Filter spacing screens increase flow rates 20 to 50% . . .

coarse wire cloth backing gives higher rates than perforated plate backing with same open area

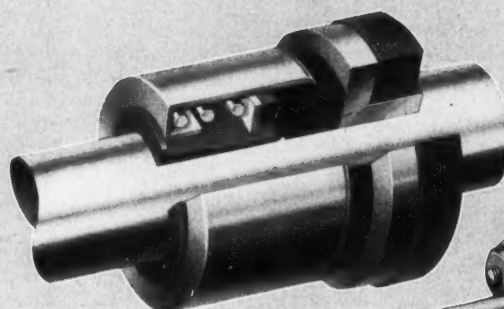
The results of testing at Columbia University indicate that the introduction of a spacing screen between filter cloth and perforated plate will increase flow rates 20 to 50% at a pressure drop of 1 psi. Results also indicate that, when a spacing screen is used with a given filter cloth, the open area of the backing plate has no effect upon the flow rate. Also, for a given filter cloth, it was found that a higher flow rate is obtained with a coarse wire cloth backing — such as No. 4 mesh, 0.105" wire dia — than with a perforated plate backing of the same open area.

With a given filter cloth and backing plate, it appears that the flow rate is practically independent of the spacing screen employed. In the test work, three different screens gave almost the same flow rates, even though their open areas varied from 35 to 50%.

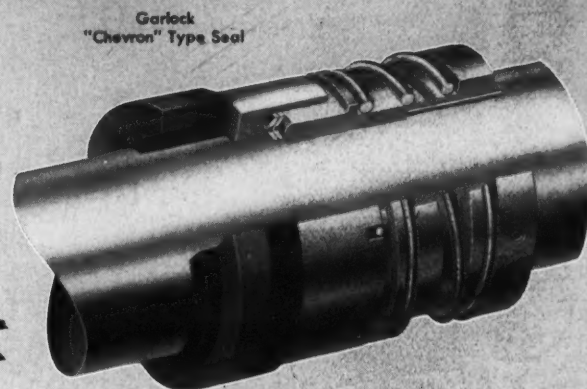
(Reported by Multi-Metal Wire Cloth Co., Inc., 1350 Garrison Ave., New York 59, N. Y.)

FEBRUARY, 1951

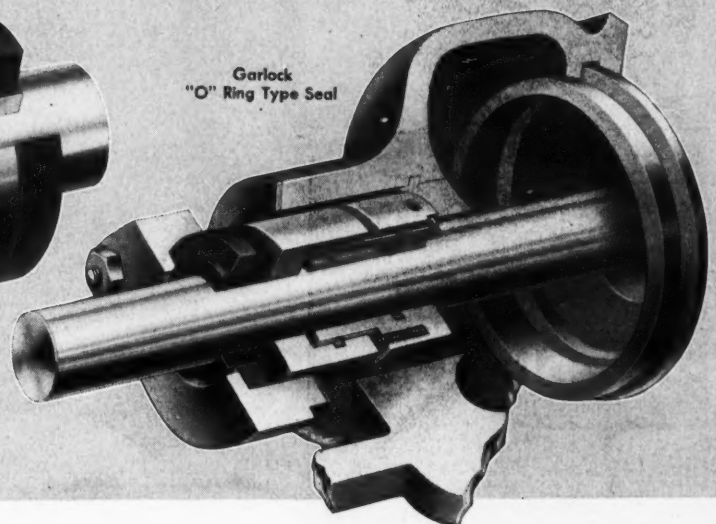
## GARLOCK MECHANICAL SEALS FOR *Rotary Shafts*



Garlock  
"Package" Seal



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"Chevron" Type Seal



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"O" Ring Type Seal

Where leakless operation of rotary shafts on pumps or other equipment is required, GARLOCK MECHANICAL SEALS will do the job.

There is no wear on the shaft when a Garlock seal is used. Sealing is effected by leakless and positive contact between carefully lapped metal-to-carbon or metal-to-metal mating surfaces. One of these elements rotates with the shaft and the other is stationary. The stationary element does not contact the shaft.

These precision-built seals are made in several standard designs and in a wide range of highest grade materials. The selection of design and materials depends upon the service in which the seal is to be used. If none of our standard designs appears entirely suitable for any specific application, a modification of a standard design or a specially designed seal will be engineered and built for that job.

Thousands of GARLOCK MECHANICAL SEALS have proved their effectiveness, durability and economy on shafts operating at high and low speeds and

pressures. Users of Garlock seals are enjoying many months—or years—of trouble-free operation on equipment handling various liquids such as, for example, water, gasoline, beer, acids and paint.

If you need Mechanical Seals for any kind of a rotary shaft application, let Garlock's experienced engineering staff work with you. Write for our Mechanical Seal booklet.

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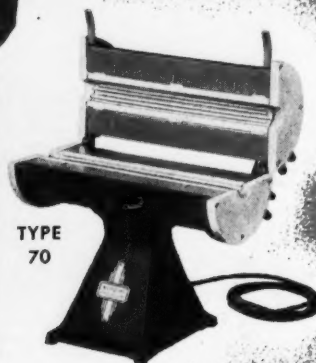
When inquiring check CP 2970 on handy form, pgs. 2-3



TYPE  
M-5036

## HEVI DUTY "MULTIPLE UNIT" TUBE FURNACES

For Carbon Determination  
and Special  
Laboratory Analysis



TYPE  
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Hevi Duty offers a complete assortment of tube type Furnaces. The various models provide for all Combustion Tube Furnace operations, as well as a variety of special applications at temperatures from 1100° F. to 2000° F. Each model has dependable "Multiple Unit" heating units, easily replaceable by the user.

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## IDEAS

### High-purity anthracene in large crystal size has been developed . . .

product has aided development of scintillation counter

The scintillation counter has not been used as widely as the Geiger counter for detecting and counting atomic particles and radiation. The limiting factor has been the phosphor, the heart of the scintillation counter, which emits light when exposed to radiation. The materials, such as anthracene, that possessed the necessary properties of an ideal phosphor could not be obtained in large enough crystals, or else had a high optical density because of impurities present.

This difficulty has been overcome by the development of a high-purity, "scintillation grade" anthracene. With this product, crystals 4" long and 2 1/2" in diameter have been produced. Even more important is the fact that the crystals, when cut to a 5-mm thickness, are nearly colorless.

Development of this anthracene has aided investigational work dealing with radioactive bodies because the Geiger counter, while being a useful tool, does have limitations. The Geiger counter measures radiation indirectly by measuring the amount of ionization the radiation produces. On the other hand, in the scintillation counter the fluorescent light is picked up by a photoelectric cell and is amplified to produce an electric current strong enough to operate a recorder.

In addition to applications in radiation laboratories, the scintillation counter has found uses in industry. One example is in production of rubber coated wire, where it is desirable to know the location of the wire connections after the coating has been applied. By using a radioactive substance in the welding flux, one can locate the connection quite readily by using a counter.

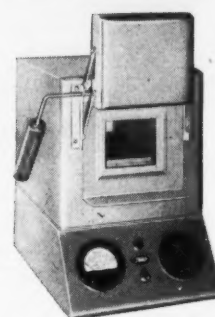
("Scintillation grade" anthracene is a development of Reilly Tar & Chemical Corp., Indianapolis, Ind.)

### Shows fans, scrubbers, diverse equipment

Eight-page bulletin gives illustrations of typical products of affiliated companies. Dust collectors, fans, scrubbers, and much other diverse equipment is presented.

Equipment bulletin is issued by The Thermix Corporation, Dept. CP, Greenwich, Conn. When inquiring specify CP 2972 on handy form, pages 2 and 3.

## MULTI-PURPOSE LAB UNIT



**TEMCO**

**SERIES 1500  
ELECTRIC  
FURNACE . . .**

An ideal furnace for ashing, ignitions, fusions, process control and general laboratory work. Fast heating and can be operated continuously to 1650° F. and intermittently to 1900° F.

Equipped with indicating pyrometer and Temco-meter stepless controller which automatically holds desired temperature unaffected by voltage fluctuations.

Welded steel case, 3" dual insulation, up-lifting counterbalanced door, 115 or 230 Volts, 60 cycles, Chamber sizes 4" wide, 3 3/4" high and 4 1/2" or 9" deep. Priced from \$92.50 to \$112.50. Write for data and dealer's name.

**THERMO ELECTRIC MANUFACTURING CO.**

476 Huff St., Dubuque, Iowa.

When inquiring check CP 2973 on handy form, pgs. 2-3

**Much Ado About Nothing**

PUBLISHED IN THE INTEREST OF BETTER VACUUM PROCESSING

VOL. 1 BEACH-RUSS COMPANY

**IZZAT 50?**

*Laying It On . . . But Thin!* Many's golden diggers do not know today. And they cost very little. A vacuum pump is a device which is separated on the inside from which the gases are made. This coating is very thin that the actual amount of material is very small.

This is a "gettering" vacuum pump. It is a vacuum pump which is used for the purpose of maintaining a high vacuum in a chamber. It is a vacuum pump which is used for the purpose of maintaining a high vacuum in a chamber. It is a vacuum pump which is used for the purpose of maintaining a high vacuum in a chamber.

**Ask Us to Send This House Organ REGULARLY . . .**

**It'll give you new ideas many times a year on uses of high vacuum applicable to your work.**

**Just send your name, title, company and plant address.**

Continued on page 2

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When inquiring check CP 2974 on handy form, pgs. 2-3

CHEMICAL PROCESSING

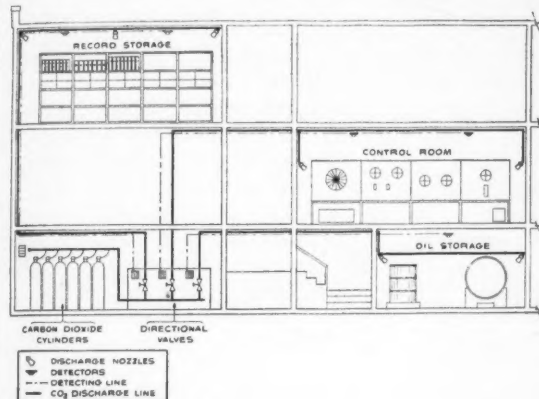
When inquiring check CP 2971 on handy form, pgs. 2-3

### As many as 25 hazard areas are protected by single extinguishing source . . .

directional valves divert discharge of 1 bank of CO<sub>2</sub> cylinders to area of plant on fire

In practically every industrial plant there are numerous remotely located areas where a fire might get started unnoticed and mushroom into a blaze that would be beyond the power of portable extinguishers to control. Naturally a built-in fire extinguishing system would appear to be the solution. However, to protect each of 5 or 10 such hazard areas with its own system would be costly, if not wasteful of valuable production space.

Now, through the use of directional valves, a single carbon dioxide cylinder bank can protect as many as 25 hazard areas on a 24-hour basis. As the diagram shows,



Shows how a single source of extinguishing agent can be employed for fire protection in a number of wide-spread areas of a plant

the supply source of the "Multi-Space Fire Guard System" comprises storage cylinders manifolded together for simultaneous discharge. Cylinder bank can be arranged in groups so that each of several hazard areas can be protected by an initial discharge group and a reserve discharge group of cylinders.

Carbon dioxide discharge pipeline from the cylinder bank connects to a directional valve frame, where there is a valve for each hazard area protected. From the directional valve frame a carbon dioxide discharge line and a fire detector connecting line run to each hazard area.

Each protected area has one or more fire detectors (rate-of-temperature-rise, smoke, or electrical types) and a network of Multijet nozzles. When the detector picks up the first signal of fire it actuates the directional valve controlling the group of cylinders for that area. A mechanical linkage opens the release valves on the heads of the cylinders, and carbon dioxide rushes through the discharge piping under its own pressure to the scene of the fire.

For utmost safety and efficiency in fire control, the system usually includes automatic controls to close doors, windows, and ventilating dampers; sound an alarm; and operate switches to shut off electrical machinery. In addition, the system lends itself to manual operation, both at the directional valves and the hazard area. (Components of this fire extinguishing system are products of Walter Kidde & Company, 40 East 34th Street, New York 16, N. Y.)

FEBRUARY, 1951

### SOAP MAKER DOUBLES OUTPUT WITH CELITE FILTRATION

Using one of the nine standard Celite filter powders, a J-M filtration engineer showed this liquid soap maker how to step up his production 100%. With the same filtration equipment, 2000 gals. of soap are now filtered per day, against less than 1000 gals. previously.



## Why you'll get *faster* filtration with Celite

IF YOU ARE UP AGAINST THE PROBLEM of getting increased productivity from your present filter equipment, here is a suggestion that may help:

Try using Celite\* as your filter aid. One of these efficient powders will probably give you not only the *faster* filtration you want, but it may improve the purity and clarity of your filtered products as well. Here are some of the reasons why:

—Celite Filter Aids are accurately graded according to particle size—each grade is designed to "trap out" suspended impurities of a given size and type. From the nine standard grades available, you can select the one that will give you a *maximum rate of flow through your filter presses*, consistent, of course, with the clarity you desire.

—At any time, you can re-order your regular Celite Filter Aid with the assurance that you will always get the same uniform, accurately-graded powder you were using previously. Thus, with Celite, you can count on *continued* high speed filtration, month after month, year after year.

—Celite Filter Aids are of high purity—mined from the largest and purest deposit of diatomaceous silica known, then carefully processed to assure both purity and uniformity in the finished product.

Near you is a Celite Filtration Engineer who will be glad to study your problem and to recommend the Celite Filter Aid that will remove the bottleneck from your filtration operations. His services are at your disposal. Write Johns-Manville, Box 290, New York 16, N. Y. for details. In Canada, 199 Bay Street, Toronto 1, Canada.

\*Celite is a registered Johns-Manville trade mark.



## Johns-Manville CELITE

### FILTER AIDS AND FILLERS

When inquiring check CP 2975 on handy form, pgs. 2-3

## GET YOUR COPY OF Bemis Multiwall Packaging Guide

... it shows how to do a more efficient packaging and handling job and save materials and labor. Deals with Storage of Empty Bags, Filling and Closing, Handling of Filled Bags, Palletizing and other important topics. Ask your Bemis Man or write to the nearest Bemis office. No cost to you, of course.

# Bemis



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When inquiring check CP 2976 on handy form, pgs. 2-3

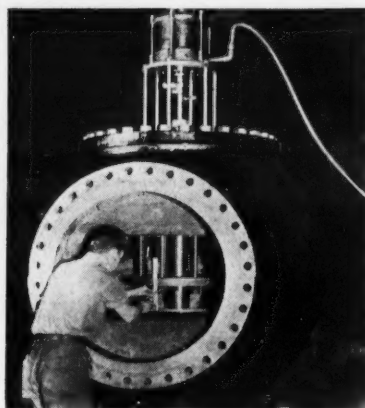
## IDEAS

**Largest 2-port control valve takes merely 1 second to fully open or close . . .**

has 36" pipe connections; provides tight shut-off

What are believed to be the largest double-ported control valves ever built have recently been completed. With 36-inch pipe connections, the huge valves provide absolutely tight shut-off, and move from fully-open to full-closed position in a matter of merely 1 second. According to manufacturer, the valves are giving satisfactory service in one of the nation's tonnage oxygen plants.

In design, the guiding problem for the valve plug was extremely intricate



Believed to be the world's largest double-ported control valve

because installation requirements made it necessary for the valves to be on their sides. This problem was solved by equipping the guide posts with linear-type roller bearings which permit friction-free movement of the valve plug between open and closed positions.

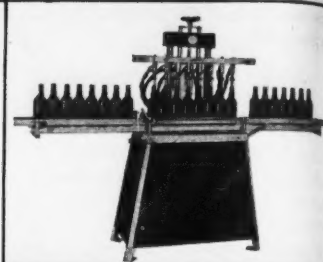
Development of Kieley & Mueller, Dept. CP, North Bergen, N. J. . . . or for more information check CP 2977 on handy form, pages 2 and 3.

### Provides useful information on thin stainless steel

Paper-thin stainless steel is the subject of 4-page folder showing applications of stainless steel .010 to .001" thick. Complete information is given on typical mechanical properties, advantages, and method of supply. Of special importance is description of thin-gauge strip, which has tensile strength reported to be comparable to that of the best carbon spring steel. "Paper-Thin Stainless" is issued by Armco Steel Corporation, Dept. CP, Middletown, O. When inquiring specify CP 2978 on handy form, pages 2 and 3.

## Filling Accuracy at an Attractive Price

## PACKER VACUUM LIQUID FILLING MACHINE



Fills up to 80 containers per minute

Packagers of liquid products all over the world acclaim the speed and versatility of their Packer Vacuum Liquid Filling Machines.

Models with 6, 8, 10 or 12 spouts...fills liquids — thin, foamy, viscous, hot or cold...BOTTLES from fractional ounces to gallons — CANS up to quart size.

Clean. Accurate. Quick changeover. Liquid contact parts of stainless steel, brass and resistant materials. The Packer Vacuum Filler will be adapted to the exact requirements of your product.

Write for complete information

## PACKER MACHINERY CORP.

32 Irving Place, New York 3, New York

When inquiring check CP 2979 on handy form, pgs. 2-3

## Save Your Heat Exchangers



**Y**OU run the risk of tube damage beyond repair every time you rod-out your heat exchanger bundles.

A much safer way . . . a much faster way to descale your heat exchange units is to circulate a solution of Oakite scale-dissolving compound.

Your local Oakite Technical Service Representative will gladly demonstrate this time-saving, money-saving, tube-saving way to clean heat exchangers in-place. Call him today. Or write Oakite Products, Inc., 18F Thames St., New York 6, N. Y. No obligation either way.

SPECIALIZED INDUSTRIAL CLEANING  
**OAKITE**  
MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U.S. & Canada

When inquiring check CP 2980 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Tests prove resistance of mica-base coating to weather, alkalis . . .**

three-coat system appears superior to standard three-coat systems now in use

The life of the finish on Westinghouse pole-type distribution transformers has been more than doubled by a three-coat, mica-base paint system that has been given the name, "Coastal Finish." Each coat functions in cooperation with the others to withstand oxygen, acids, salts and alkalis found at the seacoast and in industrial atmospheres. The system is applied in the same manner as standard finishes, and is baked on in production. An air-drying modification of the system makes it possible to patch a coating in the field if necessary.

Pole-type distribution transformers operate under severe conditions. Temperatures affecting the finish may vary as much as 250°F. If a coating does not offer protection, corrosion may eventually eat through the casing, making holes for the insulating oil to leak out, thus causing the transformer to fail.

Each coat of the finish has a special function. The first, or prime coat, is applied after the metal has been cleaned and treated with phosphate solutions. It consists of zinc chromate combined with iron oxides in a suitable vehicle. The first component contributes efficient rust inhibition. The second, iron oxide, makes the coat less brittle so it can accommodate expansion and contraction without cracking. Actually, when tested alone, this combination is less effective than some others and it is only when the coat is combined with the second and third coats that its special characteristics are found.

The "key" coat is the second one. This intermediate coat consists of mica flakes in a vehicle of modified phenolic and alkyd resins. The mica flakes give a "shingled roof" effect to ward off moisture and oxygen. The mica enhances heat stability of the paint as much as ten times at the elevated temperatures at which distribution transformers operate.

The third or final coat screens out ultraviolet light from the sun, enhances resistance of the other two coats to corrosive elements, and adds to the appearance.

The mica-base paint has been exposed to accelerated life tests in the laboratory with excellent results. Two transformer tanks, one with the three-coat mica-base finish and one with the three-coat standard finish, were exposed to a 20% solution of sodium chloride at 90°F with 15 lb pressure for 1000 hours. Referring to illustration, the standard finish (right) shows severe corrosion. The finish is completely gone from the cover and from many areas on the tank walls. The mica-base finish (left) shows no signs of deterioration or corrosion.

Panels with the three-coat standard finish and with the three-coat mica-base finish were exposed on both Florida and California coasts. At the end of 18 months of exposure, none of the mica-base panels showed any signs of corrosion. The standard panels showed edge corrosion and rust creepage for about 1/16" in from the edge. Some chalking had taken place on both panels.

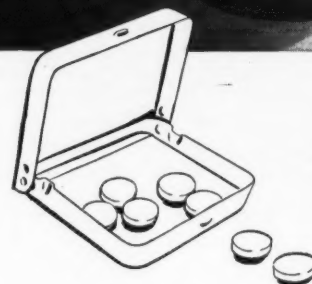
The Coastal Finish exhibits as good resistance to acids as the standard finishes, but lab tests indicate that it is superior to alkali resistance.

Further information is available from Mr. J. Ford, Westinghouse Electric Corporation, 306 Fourth Ave., P. O. Box 1017, Pittsburgh 30, Pa. Samples of mica-base paint are also available at this address.

FEBRUARY, 1951



Continental is the largest producer of utility containers in the U. S. The Continental line of steel containers includes lug cover pails, utility cans, flaring pails and closed-head drums in light and heavy gauges. After serving their original purpose, they can be re-used in many different ways.



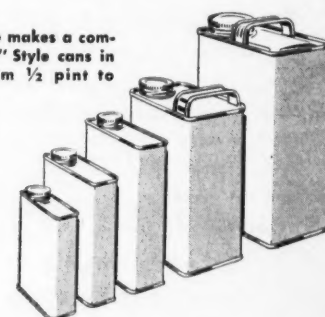
## Sure Relief **FOR** **SHIPPING HEADACHES**

Damaged shipments are a headache. They put a dent in profits and strain customer relations. Those headaches will leave in a hurry when heavier products are packed in Continental steel containers.

Continental's rugged pails and drums are built to take it. They give top protection during every mile of travel, weather the roughest handling, and come up beaming sales appeal.

There's no question that it is sound salesmanship to put trade-mark and sales message on the side of every pail and drum that's shipped—and the better the lithography the better the salesmanship. Continental's master lithographers have the skill and experience to lithograph steel containers in colors and designs that really sing. Another good sales idea is to standardize labels . . . give the entire line a family appearance.

Continental also makes a complete line of "F" Style cans in every size from 1/2 pint to one gallon.



# CONTINENTAL © CAN COMPANY

Eastern Division: 122 E. 42nd St., New York 17 • Central Division: 135 So. La Salle St., Chicago 3 • Pacific Division: Russ Building, San Francisco 4

When inquiring check CP 2981 on handy form, pgs. 2-3



**How DAY  
gives you MORE  
for your dust  
filter dollar**

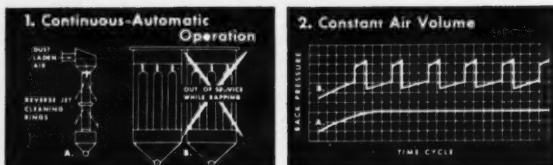
Licensed by H. J. Hersey Jr.  
Illustration shows unhooded unit

The DAY Type "AC" Dust Filter helps make important savings two ways in your dust control program. *First:* you save money on original cost because you buy *less* filter to handle *equal* volumes of air. With DAY's continuous-automatic

operation, only 1 3/4% of the filter cloth is lost for cleaning instead of losses up to 50% which occur in most other types of filters. Also, DAY's gentle, reverse air-jet cleaning action permits use of better filtering fabrics for a greater air-to-cloth ratio. Thus *less* cloth and a *smaller* filter do the same job as much larger rapping type units.

*Second:* economy stems from the DAY filter's compact design. Less floor space is needed and installation costs are minimized. Its simple, rugged construction gives years of dependable service at rock-bottom maintenance costs . . . economy all the way.

### THESE ADVANTAGES MAKE THE DIFFERENCE



**A.** Reverse air-jet cleaning rings travel up and down the tubes of a DAY filter, constantly cleaning the cloth.

**B.** Most other types of filters must shut off a complete section for cleaning or rapping. This may amount to 50% of the cloth area.

**A.** Back pressure rises slightly when the DAY filter is first started, then levels off and remains uniform. This assures the constant air volumes necessary for efficient dust collection.

**B.** Sharp back pressure and air volume variations occur in rapping type filters when sections are shut down for cleaning.

**To learn more  
about all its  
advantages**

Write-to-DAY for Bulletin 491



**The DAY Company**

SINCE 1881 852 3rd Ave. N.E., Minneapolis 13, Minn.  
IN CANADA: P. O. Box 70, Ft. William, Ontario  
Branch Plants in Ft. Worth, Buffalo and Welland, Ontario

When inquiring check CP 2982 on handy form, pgs. 2-3

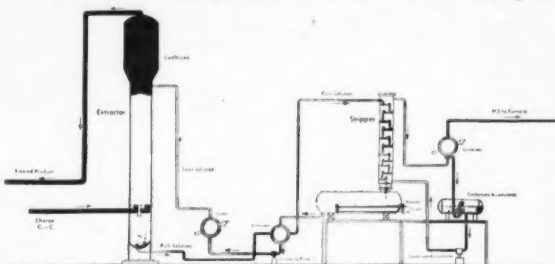
### IDEAS

#### Refinery removes hydrogen sulfide from poly plant charge with tripotassium phosphate . . .

regenerative type unit treats 4800 BPSD of charge holding 300 gr  $H_2S$  per 100 scf, 1%  $CO_2$

The Mid-Continent Petroleum Corporation is running a regenerative type hydrogen sulfide removal unit to treat 4800 barrels per stream day of liquid-phase poly plant charge containing 300 grains of  $H_2S$  per 100 scf and 1% carbon dioxide by volume. They are using the tripotassium phosphate process patented by Shell Development Company.

Process flow is illustrated schematically in the flow diagram. Hydrocarbon charge at 300 psi and 100°F enters base of extractor and flows up countercurrent to a descending stream of tripotassium phosphate solution in a tower packed with stoneware Raschig rings. A liquid level controller above the packing controls flow of phosphate



Flow diagram of liquid-phase hydrogen sulfide removal process at Mid-Continent Petroleum Corporation

solution out of the bottom of the tower. The upper settling zone of the tower contains a coalescer in the form of metal textile mesh which helps to prevent entrainment. Use of a coalescing section helps reduce cost of the unit by eliminating the need for an extra knockout drum with its attendant piping, control instruments, pumps, etc.

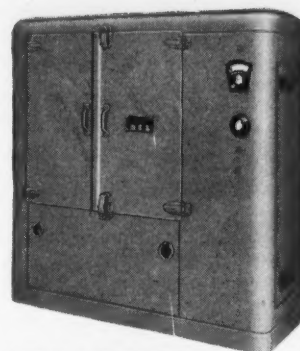
The  $H_2S$ -free hydrocarbon leaves the top of the tower and enters water-wash facilities (to maintain moisture of the catalyst), and thence goes to the poly plant. The  $H_2S$ -rich phosphate solution leaves the bottom of the tower under its own pressure and is heated in a series of double-pipe exchangers, heat being furnished by stripped solution on its way back to the extractor tower from stripper reboiler. The heated rich solution enters the top of the bubble tray stripper.

In the stripper, a countercurrent flow of steam removes the  $H_2S$  from the solution. Partially stripped solution drops to a regenerative surge drum where it is boiled up, completing the scrubbing of the sulfide from the solution. Lean solution is passed through the exchangers which heat up the rich solution, is pumped from atmospheric to 300 psi, and is further cooled by heat exchange with water before it enters the extractor tower.

Low-pressure steam exhausting from the reciprocating pumps, plus a small amount of live make-up steam are used in the reboiler tube bundle. Steam formed in the surge drum by boiling the solution rises in the stripper and carries the  $H_2S$  with it. Stripper operates at substantially atmospheric pressure since any increase in pressure makes stripping more difficult and increases steam consumption.

The steam, together with the  $H_2S$ , passes overhead from the stripper to a condenser where the steam is condensed. The  $H_2S$  leaves from a vent and is led to a furnace where it is burned. Condensate passes back through the

## accuracy at High Operating Speed with Despatch LABORATORY OVENS



Despatch Laboratory Production Ovens are ideal suited to all types of research . . . testing . . . production control. They are designed to provide the closest heat uniformity through every inch of the work chamber . . . consistently accurate temperature control at all heat capacities loads at any desired operating temperature.

Chemical and analytical drying and baking, preheating and aging, sterilizing and curing, food dehydrating — these are just a few of the uses. Available in six models, with inside dimensions ranging from 13" x 13" to 37" x 25" x 50".

- Positive Air Intake
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- Modern Design — Rounded Corners

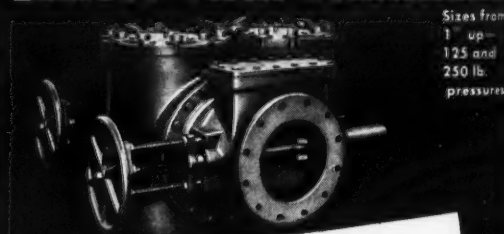
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Established 1907

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343 DESPATCH BLDG., MINNEAPOLIS 14, MINN.

When inquiring check CP 2983 on handy form, pgs. 2-3

## ELLIOTT TWIN STRAINERS



**No liquid touches  
valve screw threads**

because the valve shaft, and not the valve screw, is in contact with the liquid. Gate valve design is used for positive tightness. If chain drive or valve interlock is desired for simultaneous valve operation, sprockets, chain, and handwheels may be applied without removing valve screws.

Get all the details on these improved Twin Strainers. Write for Bulletin A-13-N.

A-303

**ELLIOTT COMPANY**  
Accessories Dept., JEANNETTE, PA.  
DISTRICT OFFICES IN PRINCIPAL CITIES

When inquiring check CP 2984 on handy form, pgs. 2-3

condenser and flows down through the outer portion of an annulus which is concentric with the inlet steam pipe. Object of this arrangement is to reheat the condensate so that the equilibrium  $H_2S$  dissolved in the condensate will be a minimum. Condensate drops from the condenser to an accumulator through a water sealing leg, whence it is pumped back to the stripper.

Mechanical operation of the unit is quite simple and requires very little attention. It takes only a small amount of extra time on the part of an operator already assigned to the catalytic polymerization unit.

Removal of hydrogen sulfide by means of regenerative tripotassium phosphate is also applicable to gas-phase  $H_2S$  removal. A new application of this process is the selective removal of  $H_2S$  from a gas containing a high  $CO_2$  content.

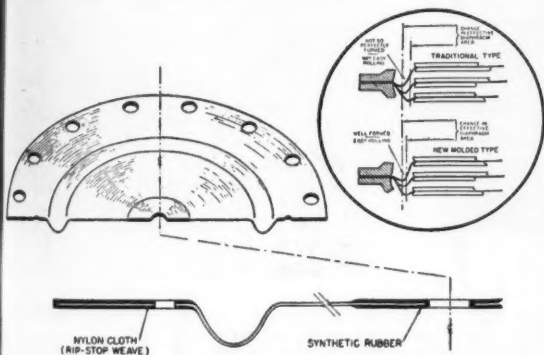
(Taken from article appearing in Volume XXV, Number 4, of "Heat Engineering," a publication of Foster Wheeler Corporation, 165 Broadway, New York 6, N. Y.)

#### With nylon-in-rubber diaphragm, high-pressure regulators need less servicing . . .

diaphragm design makes it easy to assemble in equipment and insures positive sealing

A diaphragm of molded synthetic rubber strengthened with nylon fabric is intended to replace conventional flat leather and synthetic diaphragms for high-pressure regulators. In this application, it is said to improve the precision of gas pressure control, aid the assembly of the diaphragm in such equipment, and to increase the period of trouble-free regulator service with respect to diaphragm maintenance.

Because of its molded torus shape, the free area of the diaphragm rolls easily and smoothly. Consequently, pressure variations due to changes in effective dia-



Construction details of nylon-in-rubber diaphragm

phragm area with change of diaphragm position (see inset in illustration) are minimized.

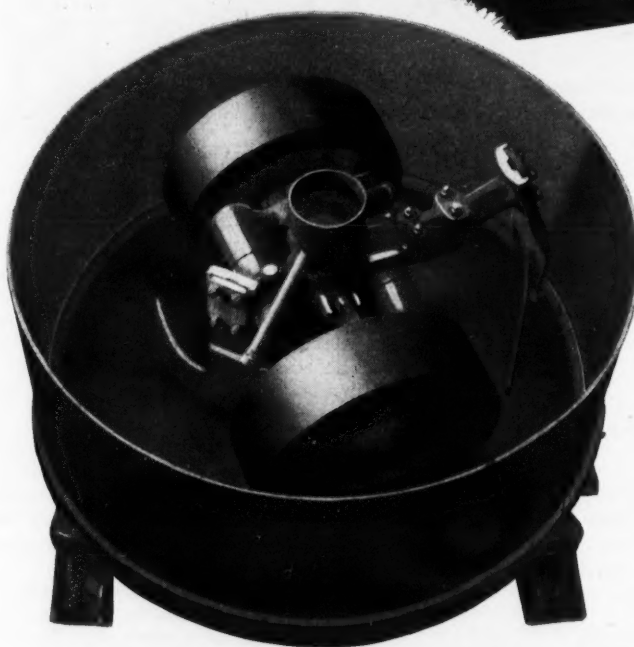
Extra thickness of rubber at clamping areas provides greater ease of assembly, insures sealing, and reduces possibility of cutting the diaphragm clamped between flanges. Seepage of high-pressure gas along the fibers of the inserted nylon fabric is prevented by a special weave and by sealing-off the nylon insert clear of the outer diaphragm edge.

Rubber composition is selected for its resistance to fractions of hydrocarbons encountered in gas pressure regulator applications. (Rockwell Manufacturing Company, Pittsburgh, Pa.)

FEBRUARY, 1951

## 2 SIMPSON Mix-Mullers® now do a better, faster job than 7 PADDLE MIXERS

Moorman Mfg. Co. increases  
production of mineral  
type stock feed



TWO Simpson Mix-Mullers have replaced SEVEN paddle type mixers used in the preparation of animal feed at the Moorman Mfg. Co. plant.

In addition to the two "No. 3" Mix-Mullers in use for straight "on-the-line" production, two "laboratory" size Mix-Mullers are used for pre-testing and pilot work. In both cases, their Simpson Mix-Mullers have enabled this progressive company to do a better, faster job with a fewer number of mixers.

This is far from being an isolated case. Hundreds of plants have found that, through the true mulling principle of mixing found only in Simpson Mix-Mullers, they can mix practically all dry, semi-dry and plastic materials better, faster, at less cost. Let us show you how these efficient units can benefit you. Write for details.



### SIMPSON Mix-Muller® División

NATIONAL ENGINEERING CO., 624 Machinery Hall Bldg., Chicago 6, Ill.

Manufacturers and Selling Agents for Continental European Countries—George Fischer Limited, Schaffhausen, Switzerland. For the British Possessions, Excluding Canada and Australia—August's Limited, Halifax, England. For Canada—Dominion Engineering Co., Ltd., Montreal, Canada. For Australia and New Zealand—Gibson, Battie & Co., Pty., Ltd., Sidney, Australia.



When inquiring check CP 2985 on handy form, pgs. 2-3



## Clearer Water obtained in Less Space and at Lower Cost with this GRAVER REACTIVATOR

The accompanying photograph shows a Graver Reactivator installed alongside a conventional rectangular treating tank for water supply.

The two units have the same capacity — but notice the far smaller size of the circular GRAVER unit.

And this saving in space is only one of the GRAVER advantages. With initial raw water turbidity varying between 50 and 200 ppm, the smaller GRAVER unit produces an effluent with only 4.5 ppm turbidity . . . less than half that of the effluent from the larger conventional unit, and with no greater cost of chemicals.

The Engineer operating this equipment writes: "You are to be congratulated on having a piece of equipment that really can live up to its expectations."

To be sure of dependable results in treating your water supply, such as those obtained at this plant, investigate GRAVER Reactivators. Write for complete information. GRAVER recommendations are based on 40 years of specialized experience in solving Water Treatment problems.



**GRAVER WATER CONDITIONING CO.**

*A Division of Graver Tank & Mfg. Co., Inc.*

216 West 14th Street, New York 11, New York, U.S.A.

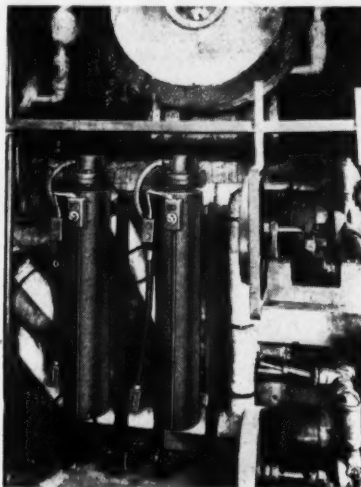
When inquiring check CP 2986 on handy form, pgs. 2-3

### IDEAS

**Heavy fuel oils, preheated by electric units, flow easier and burn better . . .**

replacing lighter grades due to lower cost, higher heating value

Light fuel oils are being replaced by heavier, lower cost grades that have higher heating value. The heavier oils generally need preheating for easy pumping and efficient combustion. Changing over to a heavy grade is often simplified by adding Chromalox electric circulation heaters either at the



These electric circulation heaters are used for preheating heavy fuel oil fed to burners

storage tank or the point of use. A typical installation is the heating of Bunker C fuel oil at the power plant of Polk Sanitary Milk Company in Indianapolis, Indiana. Here, oil is electrically preheated for easy flow to the burners where it is again heated by low-wattage Chromalox cartridge heaters in the burner reservoirs.

One of the two 10 kw circulation heaters shown in the photo operates 24 hours per day, seven days a week, at the oil storage tank which feeds two 225 hp boilers. Two burners on each boiler require 55 gallons of oil per hour. Normally, only one heater is used, but the second cuts in instantly and automatically when it is needed. Pumping rate and outside temperature are factors that determine whether one or both heaters operate. Built-in thermostatic control prevents under- or over-heating of the oil.

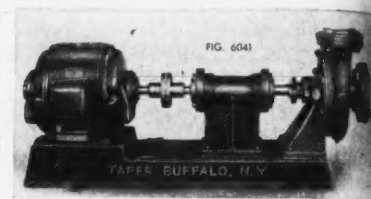
The reasons for choosing electric heat for preheating were its instant availability, simplicity of control, economical operation and freedom from maintenance. This type of circulation heater has been used successfully in brick kilns, dairies and other places.

Source: Information on Chroma-

## Performance RATINGS



PROCESS INDUSTRIES' requirements in pumps, Taber has found, thru long experience, are exacting and definite.



That is why a Taber Centrifugal Pump, built for a definite requirement, will always prove far superior to a stock or trade pump. • Taber features: a variety of impeller combinations for given-size casings; casings of various sizes for given-size yokes; over-size ball bearings, extra size shafts; extra deep stuffing boxes—all assembled and "Performance" Rated for final requirements of your job. • This is an indication of extreme flexibility and dependability of Taber Pumps. Also pump built of any metal or alloy found suitable by customer.

Write for Complete BULLETIN CL-339  
Please use business stationery. Taber Pump Co.  
Est. 1859 320 Elm St., Buffalo 3, N. Y.

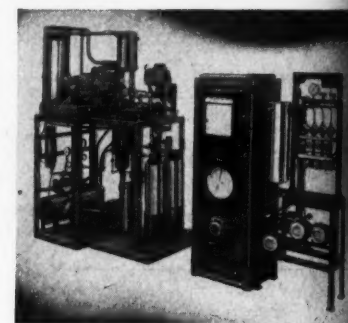
**TABER HIGHER PRACTICAL PERFORMANCE PUMPS**

When inquiring check CP 2987 on handy form, pgs. 2-3

## SUPERPRESSURE APPARATUS



Pilot Plant  
designed and  
fabricated by  
Aminco for  
Merck & Co., Inc.



With over 30 years of experience in the design and manufacture of Superpressure equipment, Aminco is best able to render you maximum assistance in problems involving pressures up to 100,000 psi. and temperatures up to 1000°F. Whether you require a single valve or a complete pilot plant, it will be to your advantage to buy Aminco, America's leading high-pressure apparatus.

Write for Catalog 406-X

REACTION VESSELS  
SHAKING MECHANISMS  
VALVES & FITTINGS  
PUMPS & COMPRESSORS  
INSTRUMENTS  
TUBING  
COMPLETE PILOT PLANTS

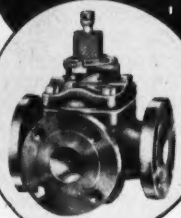
*Superpressure Division*  
**AMINCO AMERICAN INSTRUMENT CO.**  
8010 GEORGIA AVENUE • SILVER SPRING, MARYLAND

When inquiring check CP 2988 on handy form, pgs. 2-3

CHEMICAL PROCESSING

CORROSION  
RESISTANT

# Multiport Bronze Valves



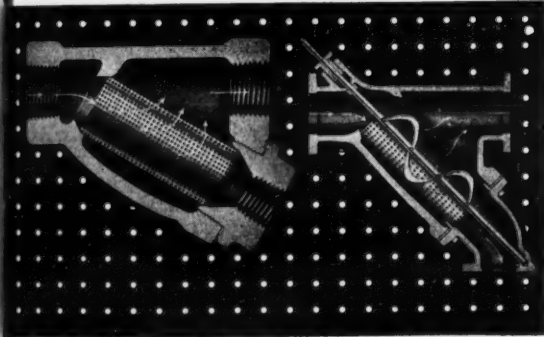
150, 225 and  
300 lb  
3- and 4-way

Various switching combinations can be made to reduce number of valves in a line or for instant reversal of flow. Highly resistant to corrosion. Lubricated plug. 3- and 4-way, 2- and 3-port. 1/2" to 8". Screwed or flanged ends. Ask for prices.

ROCKWELL MANUFACTURING COMPANY  
400 N. Lexington Ave., Pittsburgh 8, Pa.

## NORDSTROM MULTI PORT VALVES

When inquiring check CP 2989 on handy form, pgs. 2-3



Pipe-Line Strainer

Scraper Strainer

Strainers protect steam traps, regulating and reducing valves, pumps, meters or nozzles. Also, keep impurities out of fluids of all kinds. Available with scrapers for operation without interruptions for cleaning screens. Catalog Nos. 1200 and 1225.

## SARCO PIPE LINE STRAINERS

SARCO  
SAVES STEAM

SARCO COMPANY, INC.

Represented in Principal Cities

Empire State Building, New York 1, N. Y.  
SARCO CANADA, LTD., TORONTO 5, ONTARIO

IMPROVES PRODUCT QUALITY AND OUTPUT

When inquiring check CP 2990 on handy form, pgs. 2-3

FEBRUARY, 1951

### IDEAS

lox circulation heaters and other electric heating equipment may be obtained from Edwin L. Wiegand Company, Dept. CP, 7517 Thomas Blvd., Pittsburgh 8, Pa. . . or for more information check CP 2991 on handy form, pages 2 and 3.

### Tank storage terminal opens in Chicago in April . . .

leasing tankage, loading facilities to companies throughout Midwest

On April 1, 1951, General American Transportation Corporation will open their fifth Public Tank Storage Terminal in the heart of Chicago's Clearing Industrial District. Strategically located to service the entire Midwest, the new terminal offers various size tankage with unloading and loading facilities. All equipment is leased, customers enjoying the advantages and privileges of private storage without investment and the possible risk of capital.

Terminal is located on the Sanitary and Ship Canal and is serviced by all railroads entering Chicago. It is equipped to handle anything that flows through a pipeline; special equipment guards against contamination of different types of liquids and protects against excessive evaporation. As a further aid to the customer, General American supplies warehouse receipts which can be used as collateral for financing.

(Additional information may be obtained by writing General American Terminals, a division of General American Transportation Corporation, Chicago 90, Ill.)

### Aspects of electrolytic cleaning considered

Ten-page booklet contains information on the fundamentals of electrolytic cleaning, the phenomena that take place during this process, differences between various types of processes, attributes of a good cleaner, considerations in the choice of a cleaner, and similar aspects.

Cleaning of die-cast metals, cleaning of cuprous metals (including reverse current cleaning), soaker tank cleaning, and paint stripping are detailed. Typical cycles and several case histories are also contained.

"An Introduction to Electrolytic Cleaning" is issued by The DuBois Company, Dept. CP, 1120 W. Front St., Cincinnati 3, O. When inquiring specify CP 2992 on handy form, pages 2 and 3.



## SHEET METAL FABRICATION by Kirk & Blum

The fabrication of well-known alloys as well as sheet steel and steel plate (up to 3/8") has been a specialty of Kirk & Blum for more than 42 years. Your specifications are strictly adhered to and you get your products the way you want them . . . when you want them. KIRK & BLUM's wealth of experience in this field is at your service. Send us your prints for estimate. No obligation.

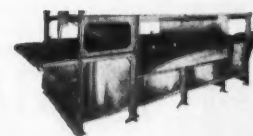
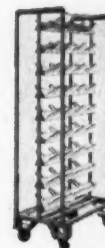
### PARTIAL LIST OF SHEET STEEL & STEEL PLATE PRODUCTS REGULARLY MANU- FACTURED FOR PROCESS INDUSTRIES

- |  |                            |
|--|----------------------------|
| Hoppers                                  | Hoods                      |
| Bins                                     | Ovens                      |
| Racks                                    | Dryers                     |
| Boxes                                    | Tanks—Steel                |
| Shop Trucks                              | Tanks—Non-Corrosive        |
| Pallets                                  | Tanks—Rubber or Lead Lined |
| Platforms                                | Pans                       |
| Cyclone Dust Collectors                  | Stacks                     |
| Piping                                   | Breechings                 |
| Air Ducts                                | Guards                     |
| Fume Exhaust Systems                     |                            |
| Dust Control Systems                     |                            |
| Air Handling Systems                     |                            |
| Pneumatic Conveying (for Bulk Materials) |                            |
| Bag Loading Systems                      |                            |
| Louvre Plates                            |                            |
| Eliminator Housings                      |                            |
| Eliminator Plates                        |                            |

## KIRK AND BLUM

The Kirk & Blum Mfg. Company  
2833 Spring Grove Ave.  
Cincinnati 25, Ohio

When inquiring check CP 2993 on handy form, pgs. 2-3



# MERIAM

## WELL TYPE MANOMETERS



Meriam Manometers in the laboratory of the North American Mfg. Co., Cleveland, Ohio, well-known makers of combustion equipment for gas and oil.

SAVE ADDITION

SAVE TIME

PREVENT ERROR

These manometers are direct reading. They save time—no additions. Likewise, prevent error. This greater ease and speed in reading have made them very popular throughout industry—in both plant and laboratory.

In the illustration the manometers measure the upstream pressure at the orifice plates in gas and air lines leading to equipment under test. At test stations in this plant they also measure the pressure of gas and air for test units.

Other industrial uses are for measuring vacuum pressures in tanks, setting gas pilots, reading pressures at blowers. In testing laboratories they are extensively used in measuring the pressure and vacuum of practically all kinds of liquids and gases. Complete information on request.

**THE MERIAM INSTRUMENT CO.**  
10940 MADISON AVENUE • CLEVELAND 2, OHIO  
WESTERN DIVISION: 4760 E. OLYMPIC BLVD., LOS ANGELES 22, CALIF.  
IN CANADA: PEACOCK BROS., LTD., MONTREAL

**MERIAM** ★  
★ *Instruments*  
ESTABLISHED 1911

MANOMETERS, METERS AND GAUGES FOR THE ACCURATE MEASUREMENT OF PRESSURES, VACUUMS AND FLOWS OF LIQUIDS AND GASES

When inquiring check CP 2994 on handy form, pgs. 2-3

## Takes Merely 2½ Minutes to Automatically Titrate to an Accuracy of 0.1 Percent

**Titration does not call for skilled operators**

**USES:** Handles routine titrations (neutralization, oxidation-reduction, precipitation, etc.) automatically.

Suitable for use as an AC-powered pH meter over the range 0 to 14 pH. Instrument will provide millivolt readings over the range from -600 to +1400 mv.

**Features:** Merely 1 to 1½ minutes are required to complete many routine titrations. Titrations to 0.1% accuracy can often be completed in 2½ minutes or less, make reports. Simple procedures for operation of the instrument eliminate need for special training.

**Description:** "Automatic Titrator" uses maker's standard glass electrodes. Control and titrator units are enclosed in metal cases, assuring maximum protection to internal parts.

In a series of titrations it is only necessary to fill the buret with titrating solution, place the sample in the receiving beaker, and then raise the beaker holder into position which automatically starts the stirring motor and begins delivery of reagent solution.

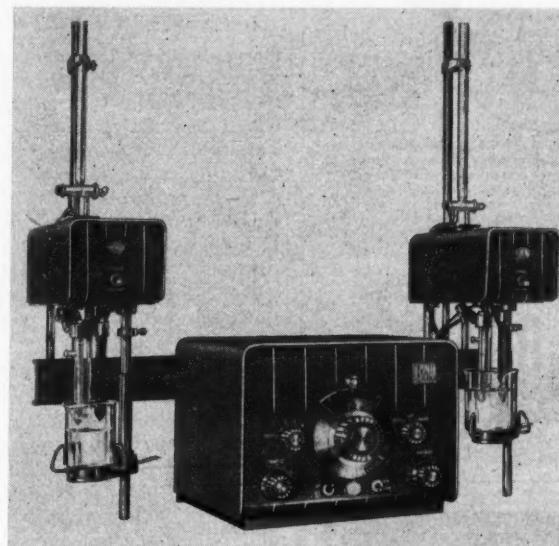
**Translates pressure differentials of 5-300" H<sub>2</sub>O into 3-15 psi transmittable pressures . . .**

assembled with remote-set controller, flows can be controlled using an air operated valve positioner

**Uses:** Two instruments being offered by this manufacturer are intended for differential-pressure and flow applications. One translates pressure differentials—for example those that exist across an orifice through which a fluid is flowing—into transmittable pressures in the range between 3 and 15 psi. Capable of translating differentials as large as 300 inches of water in systems operating at 3000 pounds per square inch pressure.

Other combines the above transmitter and a remote-set control device for controlling flow in conjunction with an air operated valve positioner.

**Features:** Response of the transmitter is very high



Automatic titrating instrument, showing control unit and two delivery units

Unique circuit employed in the instrument electrically anticipates the approaching end point, and scales-down reagent delivery in progressively smaller increments to assure accurate titration.

When the end-point is reached, reagent delivery is automatically stopped and a light signals completion of the titration—all without attention of the operator.

Adjustable holder accommodates beakers (or similar vessels) from 10 ml to 400 ml capacity. Instrument may be used with all standard burets down to 5 ml in size.

As many as 4 delivery units can be accommodated by a single amplifier control unit, thus making

a wide choice of titrating solutions always available. Provisions are made for mounting heating devices, or other special equipment, on the instrument without interfering with its operation.

**Source:** Beckman Instruments, Inc., Dept. CP, South Pasadena, Calif., is the maker. . . for more information check CP 2995 on handy form, pages 2 and 3.

—reversal of applied differentials of less than 0.01" water are detected and transmitted.

Transmission lag is reduced to a minimum in the controller. Entire control circuit (except for the air line running to the valve operator) is housed within the instrument. Lines running to the remote panel board are out of the control circuit and have no effect on the response of the controller, even though the panel may be located 500 feet away.

**Description:** "H/P Differential-pressure Transmitter" is a combination of a Barton Flow Meter and maker's Motion Transmitter. It provides standard 3 to 15 psi pneumatic transmission in a bellows-type unit that can withstand high differential-pressure overloads in either direction. Frictional errors are eliminated by the use of a torque tube and by a follow-up system in the transmitter.

Transmitter is a pilot-operated unit which maintains the

herent accuracy of the differential measuring element. Linearity (within 1/2 of 1%) results from the use of a pilot-pressure range of approximately 4 to 6 psi for the transmitted range of 3 to 15 psi.

Design characteristics include rupture-proof bellows; ambient temperature compensation; low air consumption (approx. 0.07 scfm in balanced position); negligible effect from supply-pressure variation (10 psi change in supply pressure results in 1/2 of 1% change in transmitted pressure); and wide selection of differential ranges (between 5 and 300" water).

"H/P Flow Transmitter-controller" is an assembly of the transmitter (any range) described above and a Null-matic Controller. For flow applications, the Controller has a fast reset-rate adjustment (2 to 0.02 minutes per repeat) and zero to 150% throttling range. For liquid level and other applications with longer time constants, it is furnished with a standard reset-rate adjustment (20 to 0.2 minutes per repeat) and zero to 150% throttling. Controllers can be furnished without the reset function, in which case the throttling range is adjustable from zero to 50%.

Source: Development of Moore Products Co., Dept. CP, H & Lycoming Sts., Philadelphia 24, Pa. . . or for more information check CP 2996 on handy form, pages 2 and 3.

#### Regardless of stem position, dial thermometers adjust for readability . . .

ranges for temperatures between -40 and 950°F, as well as 0 and 300°C

Uses: Four-and-one-half inch dial-type thermometers—nine Fahrenheit scale ranges cover temperatures from -40 to 950° (in 1, 2, or 5° increments), and four Centigrade scale ranges cover temperatures from 0 to 300° (in 1 or 2° increments).

Features: Unique feature of these instruments is that the stems can be placed at any angle, and cases can be rotated to any readable position. Accuracy is reported to be one scale division.



Description: Dial thermometers are

mercury-actuated type, fully Invar-compensated. Pivot links between dial and stem permit placing stems at any angle.

Union, union-flange, or separable socket connections are available. Threads are 3/4 or 1" NPT.

Source: Palmer Thermometers, Inc., Dept. CP, 2501 Norwood Ave., Cincinnati 12, O., is the maker. . . or for more information check CP 2997 on handy form, pages 2 and 3.

#### Laboratory safety expounded in forty-page manual

Revised edition of laboratory safety manual contains information on the latest techniques and equipment. Sections include accident prevention, first aid, fire prevention, and safety apparatus. Forty-page "Manual of Laboratory Safety" is issued by Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. When inquiring specify CP 2998 on handy form, pages 2 and 3.

FEBRUARY, 1951



## THERMOCOUPLE EXTENSION WIRE ... of every type, for every need

### ... AVAILABLE THROUGH YOUR



PICTURED above is one of the Brown pyrometer supplies stockrooms . . . maintained for prompt shipment of thermocouple extension wire of Base and Noble metals—available with glass, plastic, asbestos and weatherproof insulations. Through your Honeywell Supplies Man, you can benefit by the convenience and availability of such stocks—in direct delivery from Philadelphia, Cleveland, Chicago, Atlanta, Houston, Los Angeles and San Francisco.

A Honeywell Supplies Man will welcome the

opportunity to tell you all about the HSM Plan for new convenience and economy in your selection, purchasing and delivery of all your pyrometer supplies. There's a Honeywell Supplies Man near you . . . at your local Honeywell office . . . no further away than your phone. Call him today!

MINNEAPOLIS-HONEYWELL REGULATOR CO., Industrial Division, 4421 Wayne Ave., Philadelphia 44, Pa. Offices in more than 80 principal cities of the United States, Canada and throughout the world.



When inquiring check CP 2999 on handy form, pgs. 2-3

## PROVED IN PERFORMANCE



### Grinnell-Saunders Valves with CHEMICALLY INERT KEL-F\* DIAPHRAGMS

(Pat. App. For)

Grinnell-Saunders Diaphragm Valves with KEL-F Diaphragms are living up to every promise made for them. KEL-F's resistance to chemical action, low cold flow, wide range of temperature application and exceptional flex life have combined to make it the most important diaphragm development in years. Read what users are saying...

#### Typical performance reports...

1. Chlorine and HCl gas with small amounts of acetic acid and acetyl chloride at 302°F. for 900 hours. Very much superior to material it replaced.
2. Mixed aromatic and ketone solvents at 230°F. and 10 psi for three months. No sign of deterioration.
3. Chlorinated organic chemical at 158 to 194°F. and 30 to 40 psi for nine months. No failure, no shutdown, no replacement.
4. Chromyl chloride at ambient temperature and 15 psi. Diaphragm condition good at end of thirty days' test.

Complete information sent on request.

\*KEL-F is the registered trade name for polytrifluorochloroethylene, an exceptionally stable thermoplastic produced by M. W. Kellogg Co.

## GRINNELL

WHENEVER PIPING IS INVOLVED



Grinnell Company, Inc., Providence 1, R. I.  
Branch offices in principal cities.

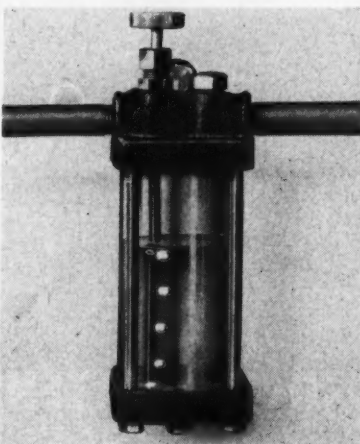
When inquiring check CP 3000 on handy form, pgs. 2-3

## PROCESS INSTRUMENTATION

### Bubbler indicates small flows of air or gas...

similar device removes dirt and moisture from line  
**Uses:** Sight feed bubbler is used in gas and air lines to control and visually indicate small rates of flow. The sediment trap is employed for collecting dirt and moisture from gas or air lines.

**Features:** Each device uses four tie rods which protect the cylinder against damage and permit easy disassembly for cleaning. Each has two tapped inlet connections — one at left side and one at left rear, and two tapped outlet connections — one at right side and one at right rear. This gives a choice of four different methods of making pipe connections, promoting convenience in hook-up.



Sight feed bubbler

through the bubbler can be adjusted within a range of less than one bubble per second to about 20 cfh. Sediment trap is rated at about 6 cfm at 25 psi differential pressure.

Units have a drain plug at the bottom for easy removal of excess liquid built up by condensation of moisture in the gas or air. With Pyrex cylinders, pressures test to 100 psi. Clear plastic cylinders are furnished for higher pressures. Provision is made for fastening to a panel, if desired.

**Source:** King Engineering Corp., Dept. CP, Box 500, Ann Arbor, Mich. . . . or for more information check CP 3001 on handy form, pages 2 and 3.

### Accuracy of temp controllers is 3/4 of 1% of full scale...

scale indicates change in temperature equivalent to 1/10 of 1% of full scale

**Uses:** Indication of temperatures, control of process temperatures, and protection of furnaces, ovens and kilns. Instruments are used on heat treating furnaces; brick, cement or ceramic kilns; melting furnaces; cooking kettles; plastics molding machines; impregnating tanks; cloth-treating ovens, and many other pieces of equipment.

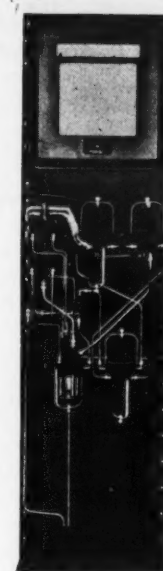
**Features:** Calibrated accuracy is within 3/4 of 1% of full scale. Indicates any change in temperature equivalent to 1/10 of 1% of full scale. Alnico, 3 1/4 lb magnet used in indicating instrument provides high flux density and allows large air gaps between armature core and pole pieces. This assures greater freedom from interference by any foreign matter that may enter the indicator. However, the indicator is sealed so that it can be safely used in humid or dirty locations.

**Description:** Included in line are flush mounted and surface mounted indicators, and flush or surface

connections — one at left side and one at left rear, and two tapped outlet connections — one at right side and one at right rear. This gives a choice of four different methods of making pipe connections, promoting convenience in hook-up.

#### Description:

The bubbler is illustrated; sediment trap is identical, except that it does not have a needle valve, dip tube or filler plug. Flow



3-POINT RECORDING GAS ANALYZERS (CO<sub>2</sub>, H<sub>2</sub>, CO)

## CAMBRIDGE GAS ANALYZERS

Labor saving — profit producing

Cambridge Gas Analyzers continuously analyze and simultaneously record on one chart from one to six constituents of a gas. They may be used for most simple and many complex mixtures of gases. Dependable and labor-saving these Analyzers make possible increased efficiency and savings in the operation of steam generating plants, cement kilns, blast furnaces; in the production of inert gases; in metallurgy, in petroleum refining and other chemical processes.

Send for literature mentioning application

## CAMBRIDGE

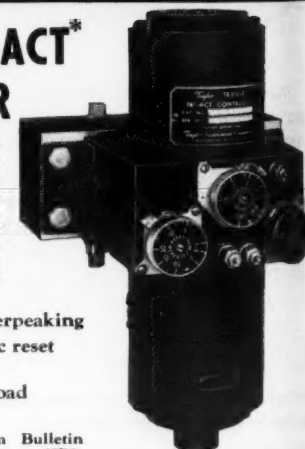
Instrument Company Inc.

PIONEER MANUFACTURERS OF  
PRECISION INSTRUMENTS  
3706 Grand Central Terminal, New York 17, N.Y.

When inquiring check CP 3002 on handy form, pgs. 2-3

## NEW IDEA In Pneumatic Control!

### Taylor TRI-ACT\* CONTROLLER



New Taylor Force-Balance Controller with new circuit is new concept in process control! Combines two proportional bands, one with rate action in closed loop ahead of automatic reset. Rate action shifts first band. Automatic reset shifts second band. You get:

1. Start-up with no overpeaking
2. Benefits of automatic reset without its evils.
3. Faster recovery on load changes.

Get complete details from Bulletin 98097. You'll see how the new TRI-ACT Controller creates new standards in pneumatic transmission systems for temperature, pressure, flow or liquid level control. Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada. Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level. \*Trade-Mark

TAYLOR INSTRUMENTS MEAN "ACCURACY FIRST"

When inquiring check CP 3003 on handy form, pgs. 2-3

mounted controllers. The controllers can be furnished as two-position (on-off) type, or as three-position type for controlling furnaces which have two separate heating circuits or two separate fuel-supply lines. The two-position type can also be furnished as a pyrometer protector which is usually used in conjunction with a separate precision controller to protect against possible failure. If the main controller fails, the protector acts at a preset temperature above the controller set-point to shut off power or flow of fuel to the furnace. Heating process can be restarted only by pressing a reset button after the furnace temperature has returned to a safe value. All instruments are the plug-in type, permitting easy replacement whenever this is necessary.

A thermocouple is employed as the sensing means. Final control element can be either a relay, mercury switch or a contractor through which electric power is supplied to furnace or oven. Normal changes in humidity, ambient temperature and voltage have little or no effect on operation. Instruments have a legible 7" scale, fitted with an anti-glare cover. A variety of standard temperature ranges in the 0-3000°F span (0-1600°C span) are available.

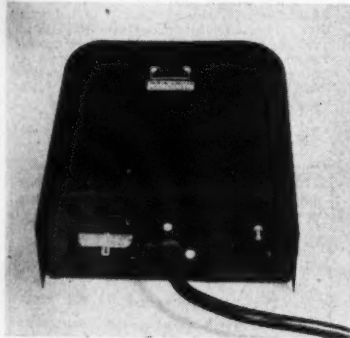
**Source:** Type HP indicators, controllers and protectors are made by General Electric Co., Dept. CP, Schenectady 5, N. Y. . . . or for more information check CP 3004 on handy form, pages 2 and 3.

#### No elaborate installation required for humidity controller . . .

plugs in-series-with power cord of humidification equipment; for relative humidities from 20 to 100%

**Uses:** Senses relative humidity and maintains any preset value between 20 to 100% by controlling the action of electrically operated humidifying and dehumidifying equipment.

**Features:** Control is a plug-in type, requiring no elaborate, delicate installation. All that is necessary for connection is merely plugging humidifier or dehumidifier cord into control, plugging control into wall outlet, and then setting dial at percentage of relative humidity to be maintained.



Plug-in humidity controller

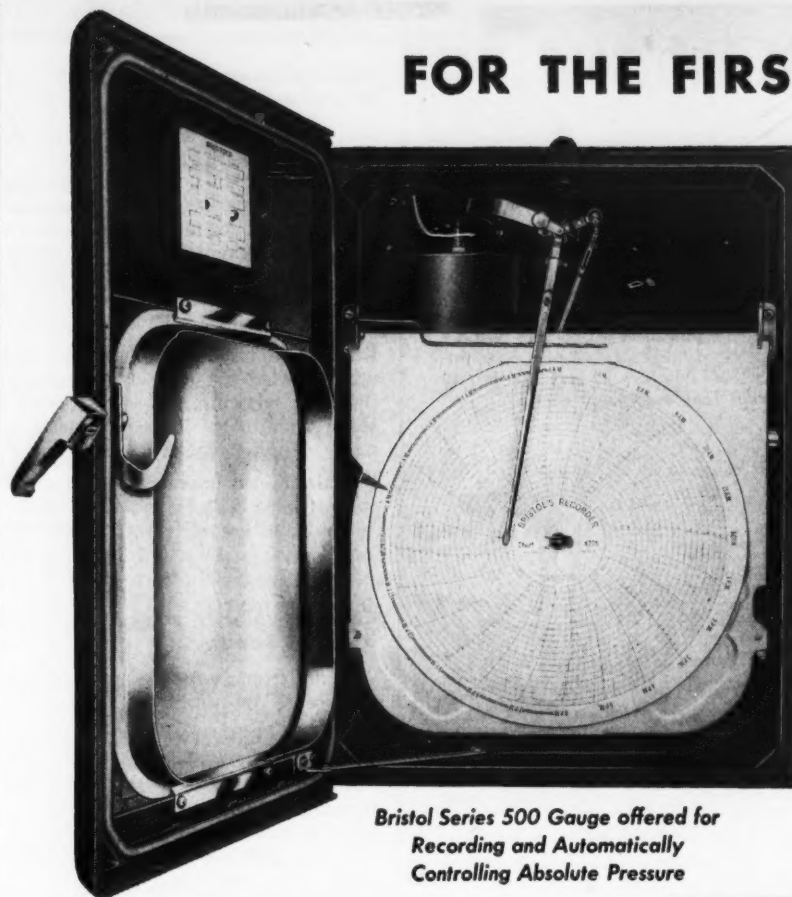
control dimensions are 7 1/4" wide x 3 3/4" deep x 6 3/4" high; net weight is 3 1/4 pounds. Control can handle a load of 15 amp at 115 volts.

Internal wiring of the unit depends upon whether it is to be used with humidifying or with dehumidifying equipment, since control action here is dependent upon either rising or lowering humidity.

**Source:** Product of the Abbeon Supply Co., Dept. CP, 59-10 41st Drive, Woodside, New York, N. Y. . . . or for more information check CP 3005 on handy form, pages 2 and 3.

FEBRUARY, 1951

## FOR THE FIRST TIME



Bristol Series 500 Gauge offered for Recording and Automatically Controlling Absolute Pressure

## Accurate Mechanical Recording and Controlling of Absolute Pressure

IN RANGES AS LOW AS 0 TO 6 MM!

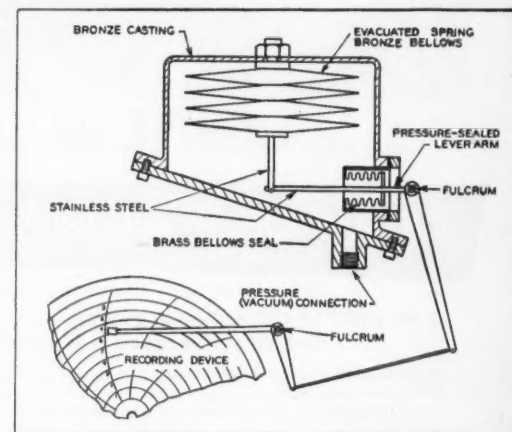
Again, Bristol scores a first!

Our new Low-Range Absolute Pressure Recording Gauge gives a direct reading of pressure above zero absolute, inherently corrected for barometric variations, with far greater accuracy than ever before possible—measuring ranges as low as 0 to 6 mm mercury absolute.

### SINGLE BELLOWS—NO COMPENSATION NEEDED

Instead of two pressure elements—one for measured pressure, one to compensate for barometric pressure—Bristol uses a single calibrated bellows element, evacuated to practically a perfect vacuum, enclosed in a cast bronze pressure-tight housing. The bellows motion is transmitted outside the housing through an entirely new device—a pressure-sealed lever arm that is frictionless, entirely free from lost motion and turning moments due to changes in differential pressure across it.

Thus—with one measuring element, Bristol's Absolute Pressure Gauge operates in ranges hitherto considered impractical with metallic elements.



### WHAT'S YOUR APPLICATION?

This entirely new, highly-accurate, direct-reading mechanical pressure instrument gives valuable information for controlling pressure wherever the operation of equipment depends upon a high and constant vacuum.

Bristol Low-Range Absolute Pressure Gauge is offered for recording, pneumatic or electric controlling, and pneumatic or electric remote transmission. For Bulletin G620, write THE BRISTOL COMPANY, 141 Bristol Road, Waterbury 91, Conn. (The Bristol Co. of Canada, Ltd., Toronto, Ont.; Bristol's Instruments Co., Ltd., Lynch Lane, Weymouth, Dorset, England.)

# BRISTOL

Engineers Process Control for Better Products and Profits

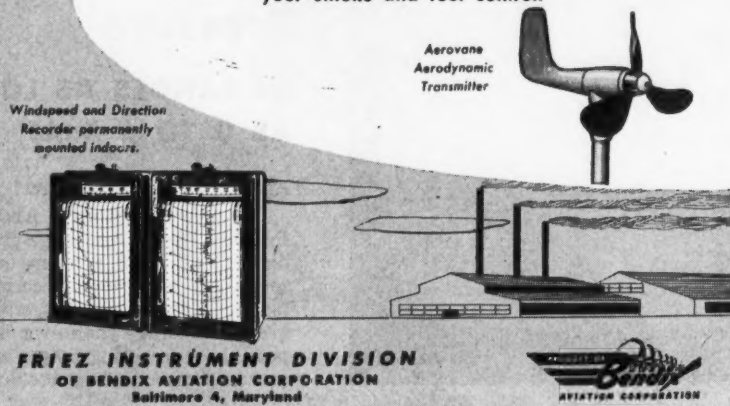


AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

When inquiring check CP 3006 on handy form, pgs. 2-3

## Your Newest Problem . . . Air Pollution

Be alert to new ordinances governing the by-products of your factory processes. Use factual wind data in developing your plans for smoke and fume abatement. Bendix-Friez wind equipment, made by the manufacturer of the world's foremost meteorological instruments, is indispensable in studying the factors relating to your smoke and fuel control.



When inquiring check CP 3007 on handy form, pgs. 2-3

## A good tool is a SIMPLE tool...

### COLEMAN JUNIOR SPECTROPHOTOMETER...

gets right to the job—saves time  
and effort because it is simple

**Accuracy is based on simple design.** No prisms, no filters, no intricate mechanisms to complicate the procedure. True measurements of transmitted light are made with the most simple technique.

**Speed is based on ease of operation.** A single dial setting establishes wavelength. No calculations or adjustments for band-pass corrections. Fixed band-pass means instant reproducibility and procedure calibrations stay valid as long as the chemistry remains unchanged.

**Reliability is based on simple construction**—no amplifiers or vacuum tubes which change with time. No mechanical complexities to wear out or require attention. Stable, rugged components, sound, solid construction mean trouble-free operation.

Save time and effort with a Coleman.  
Write for Bulletin CB-211.

**COLEMAN INSTRUMENTS** SEE WASHINGTON  
MAYWOOD, ILLINOIS

When inquiring check CP 3008 on handy form, pgs. 2-3

## PROCESS INSTRUMENTATION

### Water pressure reduced by globe-type valve

Six-page bulletin contains complete technical information on water pressure reducing valves. Valves are hydraulically operated and of the self-contained differential piston type; bodies are cast bronze, globe-shaped. They are air and water cushioned to prevent hammer and shock. Pilot valve is diaphragm-operated and spring loaded, permitting adjustment over a range of no less than 30 psi. Valves come in 3 styles, for working pressures of 150, 250, and 400 lb; and sizes from 2½ to 24".

Featured in bulletin are general arrangements of valves, with detailed list of parts. Installation, operation, adjustment, servicing, and specifications are fully described, along with tables showing general dimensions, approximate shipping weights, and general list of materials.

Bulletin W-3 is issued by Golden-Anderson Valve Specialty Co., Dept. CP, 2101 Keenan Bldg., Pittsburgh 22, Pa. When inquiring specify CP 3009 on handy form, pages 2 and 3.

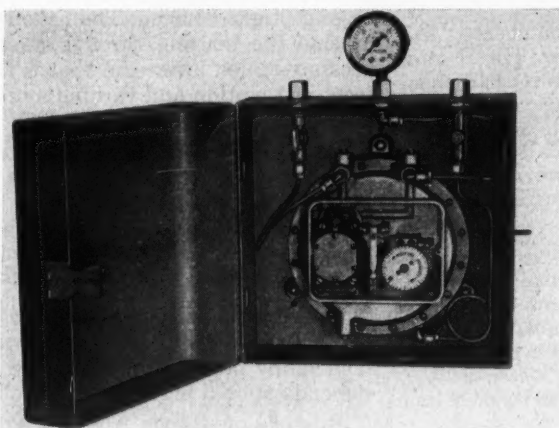
### Controls velocity of air entering hoods . . .

unit responds to pressure variation of 0.0001" WG;  
controls velocities to  $\pm 10$  fpm

**Uses:** Controlling air velocities ranging from 50 to 250 fpm. While many applications are possible, controller is designed primarily to control the velocity of air through the doors of fume hoods, employed in working with radioactive materials, where a fixed velocity is required with variable door openings.

**Features:** Responds to pressure variations of 0.0001" WG, and controls velocities within plus or minus 10 feet per minute.

**Description:** Consists of a very light, flexible diaphragm operating a pneumatic control mechanism. One side of the diaphragm is exposed to pressure within the laboratory, and the other side is connected to an averaging pressure tip located within the fume hood. Thus,



Interior of velocity controller

the diaphragm responds to the difference in pressure which causes flow through the hood door, and automatically takes into account which of the two pressures is higher. Proper control of the direction of flow, as well as difference in pressure, is assured.

Sensing diaphragm actuates a lid which opens and closes

## SET THIS METER FOR BATCH MEASUREMENT OF LIQUIDS



## NIAGARA Electriccontact METERS

### Accurate . . . Automatic

Niagara Meters offer the simplest method of measuring commercial liquids quickly, accurately. Obsolete tanks and gauge sticks are replaced by Niagara volumetric meters. An electric contact unit provides automatic shut-off for batch measurements. Engineered for a wide variety of industrial uses, Niagara Electriccontact Meters are available in several models, including stainless steel for metering chemicals. It will pay you to investigate dependable Niagara Meters.

### Send Coupon for COMPLETE DETAILS

I would like complete information sent me on how Niagara Electriccontact Meters increase processing accuracy for:

Liquid .....  
Temp. ....°F. Pressure .....p.s.i.  
Flow rate .....g.p.m.  
Maximum batch .....  
Company .....  
By .....  
Address .....

**BUFFALO METER CO.**  
2892 MAIN STREET  
BUFFALO, N. Y.

When inquiring check CP 3010  
on handy form, pgs. 2-3

CHEMICAL PROCESSING

## CARBON and SULFUR ANALYSIS

with

*Speed!  
Ease!  
Accuracy!*

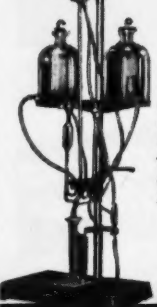
### TWO MINUTE CARBON DETERMINATOR

High degree of accuracy assured by: fan cooling gases, leveling to meniscus line, automatically maintaining atmospheric pressure, wide selection of carbon percentage scales. Accurate within 0.002% on low range Burette.



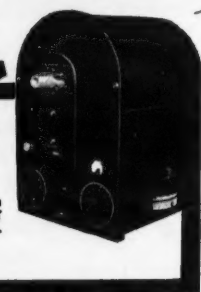
### THREE MINUTE SULFUR DETERMINATOR

Determination in accordance with A.S.T.M. specification accuracy within 0.002% inorganic or organic materials. Simple procedure.



### HIGH- TEMPERATURE FURNACE

Sturdy construction with HIGHEST QUALITY insulation.



Use 3031D Boats and Zircotubes to reduce operating cost of analysis.

Use Dietert-Detroit Carbon and Sulfur Determinators for Economical Analyses  
Write to Dept. C-3 for descriptive literature

CONTROL EQUIPMENT  
HARRY W.  
**DIETERT**  
COMPANY  
9330 ROSELAWN • DETROIT 4, MICH.

When inquiring check CP 3011 on handy form, pgs. 2-3

## PROCESS INSTRUMENTATION

a leakport. Pressure difference on diaphragm results in a proportional leakport pressure. The leakport pressure, in turn, actuates a pilot relay which varies the control pressure to damper or other controlled device. Control pressure increases in direct proportion to increase in velocity. An increase of 10 fpm increases control pressure 1 psi.

A circular dial is provided which permits adjustment of controlled velocity within operating limits of 50 to 250 psi.

Source: Velocity controller is a development of Johnson Service Co., Dept. CP, 507 E. Michigan St., Milwaukee 2, Wis. . . . or for more information check CP 3012 on handy form, pages 2 and 3.

### Research (Continued from page 4)

it would. This is evidently a case of short-sightedness on the part of administration. A very careful evaluation of the plasticizer's performance in the *end-product* should have been made before large-scale work and design were started. In fact, it might have been wise to buy, rather than make, the necessary chemicals for evaluation testing, if they were available.

My next point is economic. Despite a considerable amount of market research, administrators are apt to "jump the gun" and turn out a product in arbitrarily selected grades when its marketability would have been increased if the administrator had looked for economic danger signals. We must know what a product can do and where it should go. This is frequently different from what we feel is sufficient for it to do and where we think it ought to go.

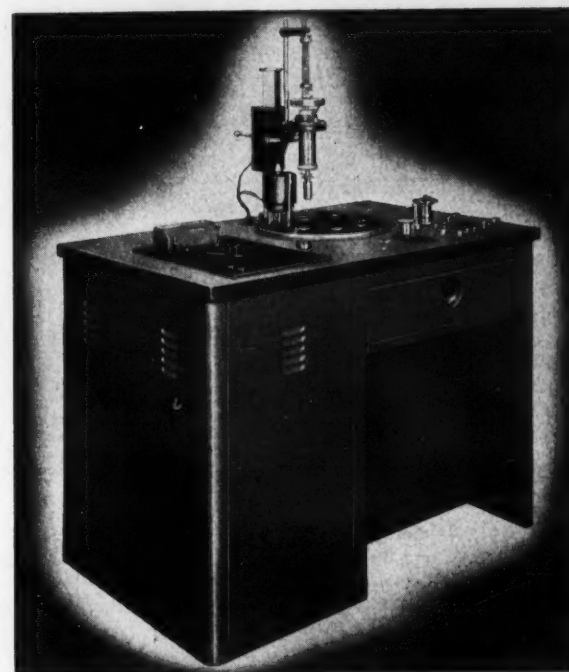
To be successful, research must be patient, persevering, and exhaustive. In financing it, more attention must be paid to the quality of the results than to the quantity, or speed in obtaining them. The best administrators are courageous in dealing with management pressures. While they can appreciate the strong incentives which oftentimes make it seem vital to meet certain time schedules, they also know that the earliest completion of a project cannot be obtained by frantic, futile motion. The soundest solutions are not always the first solutions.

A definite effort should be made from the very start of laboratory work to anticipate and accumulate whatever information will be needed to make economical design, sound construction, and efficient operation. Mistakes are much less costly if made on a small scale. A dollar spent in the laboratory can save fifty in a new plant; and data obtained on one project—thoroughly and scientifically investigated—will serve to fill the gaps on projects to come.

Now, a few final words of caution. Unless management is willing to undertake the manifold responsibilities of continued expansion, it should not set up research budgets at a traditional level to continue research at traditional rates. There comes a period of diminishing returns, unless management is resolved upon continued expansion and acts accordingly. So, too, does the research administrator have a responsibility for the expenditures of research budgets. Unless research administration is prepared to face and solve the problems of procurement of qualified personnel, organizational set-up, and expansion of facilities, then research administrators should be properly reluctant about proposing or accepting budgets which, if properly administered, will inevitably lead to an expanded company and a still further expansion of research expenditure.

For New  
**CONVENIENCE**  
in Laboratory Apparatus  
more ease, range, speed—

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to be Sure



**PRECISION-Interchemical Rotational Viscometer** is the only practical instrument for thixotropic studies of such a wide range of substances (viscosities from 1 to 2500 poises, yield values to 180,000 dynes/cm<sup>2</sup>). Finger-tip speed control for full-curve measuring, temperature control to 0.1°C. Bulletin 8-945

Other pre-tested products in the broad Precision line—"utilities" to highly specialized instruments—can make your work easier, surer, more economical. Think which of your equipment needs replacement, where your facilities should be extended . . .

Order from your  
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When inquiring check CP 3013 on handy form, pgs. 2-3

# BECKMAN

— and only Beckman —

provides such wide range versatility  
in Glass pH Electrodes . . .

The importance of modern pH equipment is widely recognized in many fields . . . from food processing to sewage treatment—mining and smelting to electroplating—textile manufacturing to sugar refining. But when considering pH equipment for your problems always remember this . . .

*"No pH meter is better than electrodes designed for use with it!"*

Only Beckman provides such a wide variety of versatile, accurate and dependable electrodes—a type to meet virtually every industrial, research, laboratory and medical requirement. This is your assurance that, in Beckman pH equipment, you have maximum adaptability to widely-varying pH applications.

Now . . . a convenient 24-page catalog illustrating the complete line of Beckman electrodes and pH equipment is available from your authorized Beckman instrument dealer. Or write direct:

Whatever your pH electrode requirements, contact Beckman.

**BECKMAN**  
INSTRUMENTS  
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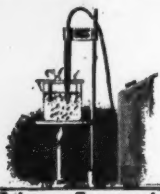
Beckman Instruments include: pH Meters and Electrodes—Spectrophotometers—Radioactivity Meters—Special Instruments

## Typical Advantages of Beckman Electrodes



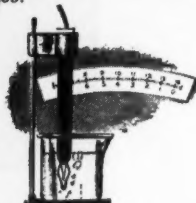
### Virtually Unbreakable

Where abrasive slurries or rough industrial service are problems, Beckman has the answer with electrodes so strong, so tough, so chemically-resistant to alkalies and acids they set entirely new standards of durability!



### Extreme Temperatures

Want to make measurements in solutions as cold as 20°C. below zero . . . or as hot as 130°C. above? Hot, cold or in-between, there's a Beckman pH Electrode to do the job!



### Wide pH Range

Electrodes covering the full pH range permit accurate measurements even at extreme limits with negligible sodium ion error whether test solution is hot or cold!



### Unique Construction

Beckman glass electrodes are factory-sealed, require no maintenance, feature patented internal shielding, heat-resistant construction, integral leads and many other advantages!

## PROCESS INSTRUMENTATION

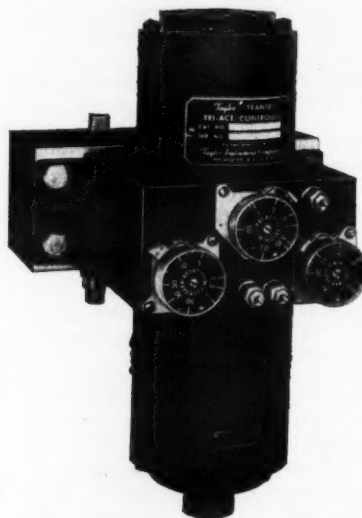
### Automatic start-up with no overpeaking possible with controller . . .

permits four times faster reset rate and rate action

**Uses:** Force-balance, non-indicating controller for pneumatic transmission systems that are used in measuring temperature, pressure, flow or liquid level. Supplements manufacturer's Transaire transmitters and miniature Transet recording receivers.

**Features:** Reported to have four times faster reset rate and rate action than conventional instruments. Allows start-up and pneumatic setting with no overpeaking. The faster response settings allow use of rate and reset response, with stability, on processes where these effects were needed but could not be used.

**Description:** New circuit contains two closed loops in series. The first contains fixed proportional response and adjustable rate action. The second has adjustable proportional response and adjustable automatic re-



Force-balance controller incorporates new control circuit

set. Such an arrangement gives the controller the ability to apply corrective action to the valve soon enough to prevent process conditions from overshooting or undershooting the set-point.

Instrument has a high-capacity relay air valve. It also has a wide range of control response adjustments which are conveniently positioned and clearly marked. Self-sealing manifold makes piping and maintenance simple. A recently developed, non-rotating type needle valve used on adjustment dials assures duplication of response settings with high accuracy.

Built-in orifice cleaners and air strain-

## Useful Throughout the Plant



Here is a sturdy, portable pyrometer that's built for tough production line service—yet is as accurate as finest laboratory instruments. It makes possible precise temperature measurement throughout the plant . . . wherever heat determination is a problem. The Type 1500 offers these advantages:

**Consistent Accuracy** to within  $\frac{1}{4}$  of one per cent full scale under almost all variable conditions. A full range of Alnor thermocouples is available for best results on any type of surface.

**Direct Reading** scale face is easily understood. No conversion tables necessary. Ten scale ranges from 0-400° to 0-3000°F. Equivalent Centigrade scales available at no extra cost.

**Compact Size**—6½" x 6" x 3", light weight makes this pyrometer highly portable and easy to use. Write today for details and prices.

ILLINOIS TESTING LABORATORIES, INC.  
Room 504, 420 N. LaSalle Street, Chicago 10, Illinois

**Alnor**

PRECISION INSTRUMENTS  
FOR EVERY INDUSTRY

When inquiring check CP 3015 on handy form, pgs. 2-3

**"LIQUIDS WORTH STORING  
ARE WORTH MEASURING"**

with a  
**LIQUIDOMETER**

*Tank Gauge*

- FOR GAUGING LIQUIDS OF ALL KINDS
- 100% AUTOMATIC
- APPROVED BY UNDERWRITERS' LABORATORIES



WRITE FOR COMPLETE DETAILS

**THE LIQUIDOMETER CORP.**  
38-18 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

When inquiring check CP 3016 on handy form, pgs. 2-3

CHEMICAL PROCESSING

When inquiring check CP 3014 on handy form, pgs. 2-3

ANY WAY YOU LOOK AT IT...

*you can  
really  
read a*

**WESTON**

**ALL-METAL THERMOMETER**



Up in the air, down in a pit, across the shop . . . you can really read the big, open dial of a Weston Thermometer. And because these rugged, all-metal instruments stand exposure, abuse—you know the temperature you read is *right*.

Various industrial, \*Max-Min, and contact-making types are standard. Consult your Weston representative, or write Weston Electrical Instrument Corporation, 585 Frelinghuysen Avenue, Newark 5, New Jersey . . . makers of Weston and Tagliabue instruments. \*Registered trademark.

**WESTON** *Instruments*

When inquiring check CP 3018 on handy form, pgs. 2-3

## BRIEFS...

*from contemporary  
publications*

READ THEM . . . IN THIS ISSUE

You get a "quick look" at the most valuable articles being published in this field, and kindred fields . . . by reading the "BRIEFS" section of CHEMICAL PROCESSING every month.

Our Editors read more than 50 contemporary publications every month . . . select those articles they believe you will want to know about . . . and, in terse style, they tell you about them. Name of publication and issue are given so you can read those you want to know more about.

It's a monthly service . . . to save you time . . . yet keep you informed. See "BRIEFS" in this issue, page 78.

## PROCESS INSTRUMENTATION

ers permit on-the-job servicing. Convenient alignment adjustments, for correct controller action, can be made with screw driver.

Source: The Transet Tri-Act controller was developed by Taylor Instrument Companies, Dept. CP, 95 Thames St., Rochester 1, N. Y. . . or for more information check CP 3019 on handy form, pages 2 and 3.

**Beam of quartz monochromator has higher intensity than arc light-prism unit . . .**

non-cumbersome instrument has one-inch aperture

Uses: Source of monochromatic light for microscopy or other purposes.

Features: Eliminates the cumbersome arc light and prism arrangement, and gives a beam of higher intensity. Collimated light from a tungsten filament lamp will yield adequate illumination at all wave-lengths in this monochromator because of the 1" light aperture available.

Description: White light from a tungsten source is passed through basal sections of optical quartz laminated to polaroid sheets. By a syn-



Source for monochromatic light

chronous rotation of the quartz sections, the wave-length of transmitted light can be varied continuously through the visible spectrum. The instrument produces an average band width of 150 Angstrom units. An adjustable support is provided for tilting the monochromator in line with light source and microscope or other apparatus.

Source: Quartz monochromator is a product of Cambridge Thermionic Corporation, Dept. CP, 476 Concord Ave., Cambridge 38, Mass. . . or for more information check CP 3020 on handy form, pages 2 and 3.

# METALAB

LABORATORY EQUIPMENT



Out of this world in **QUALITY...**

Down-to-Earth in **ECONOMY**

Imagination in Lab Equipment?

Yes, but also the sound business virtues of Economy, Efficiency, and Long Life.

Let METALAB help you plan—without obligation.

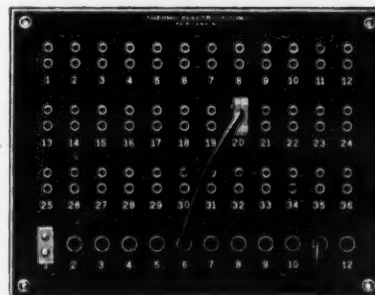
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**SECTIONAL** LABORATORY FURNITURE  
and EQUIPMENT by  
**METALAB**  
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230 DUFFY AVE., HICKSVILLE, L.I., N.Y.

When inquiring check CP 3021 on handy form, pgs. 2-3

**SAVE TIME** CONNECTING  
THERMOCOUPLE CIRCUITS  
with QUICK COUPLING CONNECTOR PANELS



PAT. PEND.

Panel for 36 Thermocouple  
and 12 Pyrometer Connections.

A rapid and flexible method for connecting numerous thermocouples to pyrometers — regardless of their location. One central point for making and breaking circuits.

Polarized Plugs and Jacks are made in all standard calibrations — Iron Constantan, Copper Constantan and Chromel Alumel.

Catalog Section 23R fully describes these Panels. Write for your copy today.

**ThermoElectric**

FAIR LAWN  
NEW JERSEY

When inquiring check CP 3022 on handy form, pgs. 2-3

**Presents various accessories for thermocouples, pyrometers**

Latest edition of thermocouple and pyrometer accessories bulletin contains 56 pages, lists many additional items not shown in previous bulletins, and offers much new data on proper application and use. Hundreds of supply items are shown, including assembled thermocouples, thermocouple wires, extension wires, protection tubes, insulators, and other accessories for the full range of industrial pyrometer applications.

New technical information and installation sketches have been added to section which contains engineering data on modern practices in pyrometry. Also included are tables of calibration data for the commonly used base metal and rare metal thermocouples. Bulletin P1238 is issued by The Bristol Company, Dept. CP, Waterbury 20, Conn. When inquiring specify CP 3023 on inquiry form, pages 2 and 3.

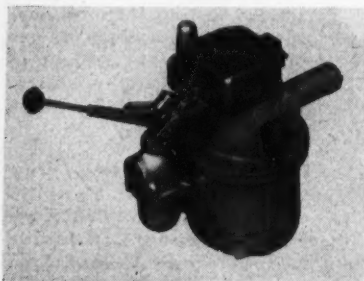
**Meters liquids to barrels . . .**

provides maximum flow rate on foaming products

**Uses:** Meters out predetermined amounts of liquids (range 25 to 79 gal) to barrels and other containers. Can be furnished to measure out liters.

**Features:** To obtain a different quantity setting, only one gear need be changed.

Speed at which shut-off valve closes may be varied, thus preventing foaming-over, but still making it possible to obtain maximum flow rates. In



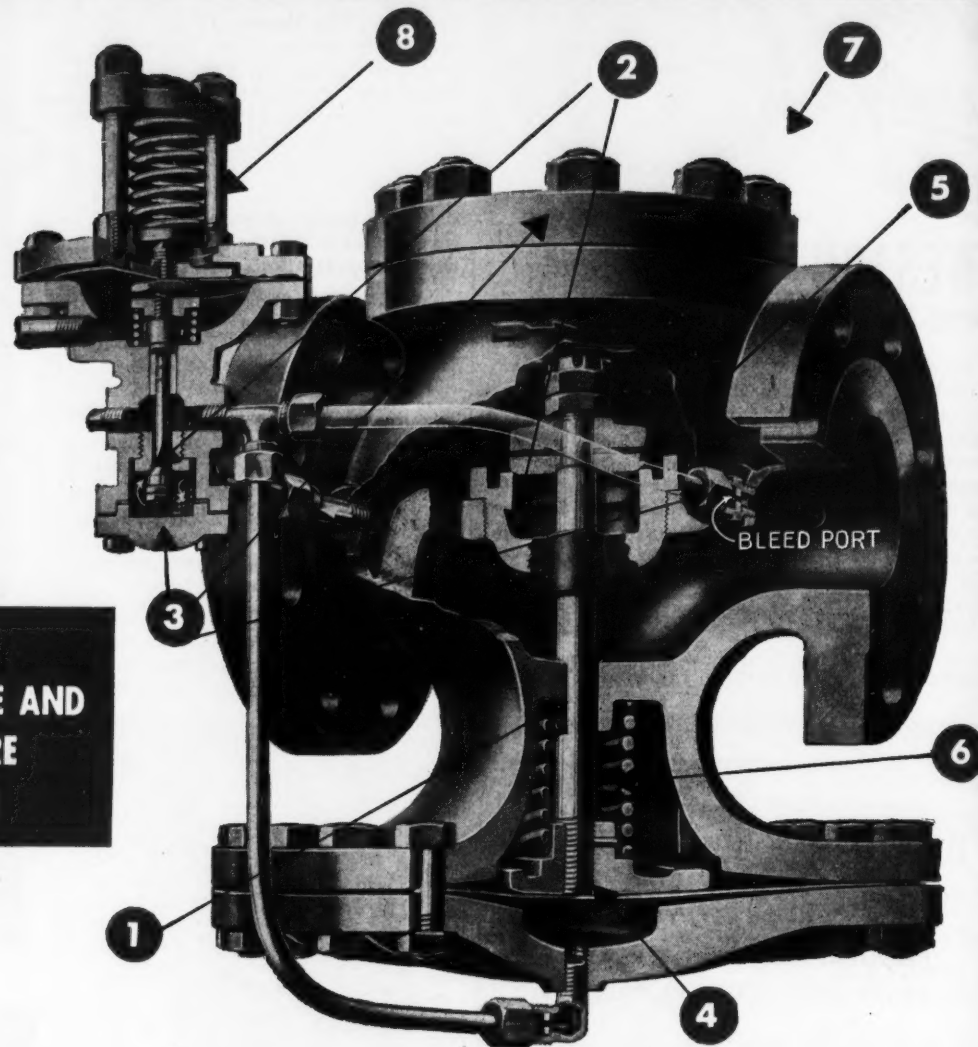
Barrel filling meter

the case of an emergency shut-off, valve can be reopened to allow completion of the shut-off cycle and filling operation without affecting the "units filled" counter.

**Description:** Repeating mechanism is equipped with two counters: one totalizing counter for registering total meter through-put, and one reset type counter for indicating the

# THESE SPENCE FEATURES Reduce

## A TYPICAL SPENCE PRESSURE AND TEMPERATURE REGULATOR



**LESS DOWN-TIME** of the system! Less time and money wasted on replacement of parts! Thousands of installations throughout the country have proved that Spence Self-Operated Regulators stay "on the line" . . . provide *dependable, trouble-free* pressure and temperature control. Users know these precision-engineered Spence units rarely need extensive repairs or special attention. Here are a few of the Spence design features that help keep *maintenance at a minimum*:

**1 PACKLESS CONSTRUCTION**—All Spence main valves and most pilots are built without stuffing boxes. This packless construction saves many maintenance man-hours because it eliminates the need for closely fitted parts which may stick or bind due to uneven expansion or foreign matter.

**2 EASY TO CLEAN**—The seat and disc of the main valve and pilot can be cleaned and any working part removed *without taking the main valve out of the line*.

**3 NO DISMANTLING FOR INSPECTION**—Special openings are provided to inspect the main valve disc, the pilot valve member and the SECO Metal bleedport. Inspection is easier, too, because the "pilot" is not an integral part of the main valve. The pilot is protected by an accessible built-in strainer.

**4 LONG-LIFE METAL DIAPHRAGMS**—Spence metal diaphragms, under usual conditions, never require replacement. Spence Regulators have few moving parts and those few are ruggedly constructed and seldom require attention.

# SPENCE PRESSURE and TEMPERATURE R

# ce Maintenance...Cut Costs

## BUILT TO LAST FOR YEARS!

That's the reason Spence Self-Operated Regulators lower over-all costs. Dollar for dollar, you can count on quality performance for a longer period of time. Look at three of many Spence features that assure long regulator life:

**5 DURABLE SECO METAL SEATS AND DISCS**—Spence seats and discs are made of durable SECO Metal which resists wiredrawing. More than twenty years of experience with SECO Metal in thousands of installations has failed to produce a single case where SECO Metal has been cut by steam.

**6 SPRING OUT OF PATH OF STEAM**—The spring in the Spence Regulator is out of the path of high-pressure steam or other fluids flowing through the valve. Since the spring operates at low unit stress, it has exceptionally long life.

**7 LESS FRICTION**—All Spence Regulators are built with packless main valves which are actuated by large, balanced diaphragms. This design minimizes friction. Valves remain unaffected by

changes in service conditions or length of service.

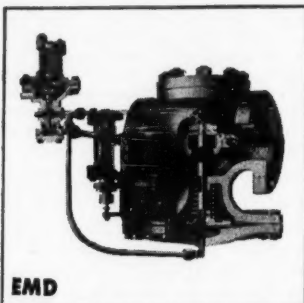
## WHY SPENCE UNITS REGULATE ACCURATELY

**8 YOU CAN BE SURE** of accurate regulation because *sensitive* pressure or temperature pilots control the main valve of every Spence unit. This unique design enables the Spence Regulator to serve many functions and handle all the various types of fluids under a wide range of conditions.

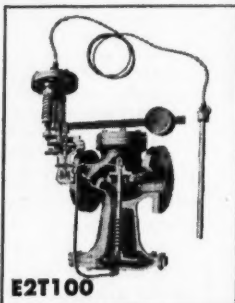
One of the great advantages of this Spence design is the interchangeability of all pilots on all sizes of main valves. Any main valve can be changed from a pressure to a temperature regulator or vice versa simply by substituting one type of pilot for another.

## WIDE RANGE OF SIZES

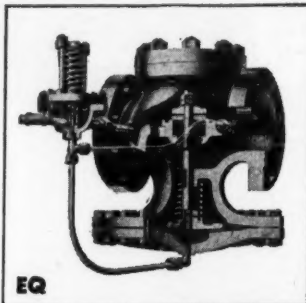
Spence Regulators are built in sizes from  $\frac{1}{4}$ " to 12" for service with air, steam, water, oil or gas. With minor adjustments, any Spence Regulator can be easily switched from one service to another.



EMD



E2T100



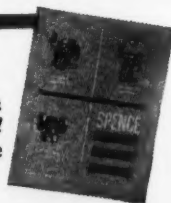
EQ

The Type EMD Pressure Regulator includes a SPENCE Solenoid Pilot to cut it on and off electrically. • The Type E2T100 Temperature Regulator in effect is a pressure regulator which is constantly reset by small variations in temperature at the sensitive thermostat. • The Type EQ Back Solenoid Pilot is a self-operated, packless unit which controls its own initial pressure. The general construction is the same as the Type ED Pressure Regulator.

## FREE BULLETIN GIVES ALL THE FACTS

YOU WILL FIND complete engineering details and selection data on Spence Regulators in free bulletin No. 5000. It features a full color, fully illustrated description of the operating cycle of a Spence Regulator. Send for your copy of this valuable bulletin today.

**SPENCE ENGINEERING COMPANY, INC.**  
WALDEN, NEW YORK



## PARTIAL LIST OF USERS

The Cleveland-Cliffs Iron Company

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The Atlantic Refining Company

Great Lakes Steel Corporation

Union Electric Company of Missouri

Todd Shipyards Corporation

Oxford Miami Paper Company

Land O'Lakes Creameries, Inc.

Ohio Edison Company

General Electric Company

R. J. Reynolds Tobacco Company

## PROCESS INSTRUMENTATION

number of filling operations or containers filled. Capacity is 60 gpm. The  $1\frac{1}{2}$ " filling nozzle (not shown in photo) is equipped with a light back-pressure valve for retaining product in the hose, thus assuring maximum accuracy unaffected by variable drainage from nozzle. Hose to valve is 40' long standard, but other lengths can be furnished.

Special gearing is obtainable for those who wish to operate outside the standard range of 25 to 79 gal.

Source: Barrel filling meter is a product of Meter Division, A. O. Smith Corporation, Dept. CP, 5715 Smithway St., Los Angeles 22, Calif. . . . or for more information check CP 3024 on handy form, pages 2 and 3.

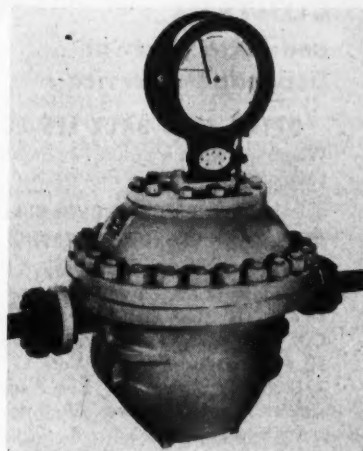
## Displacement meter good for 1000-pound gas take-off service . . .

capacities reported as high as 46,000 cubic feet per hour

Uses: For metering wide ranges of delivery gas at the take-off point. Transmission companies, gas producers, and utilities are users.

Features: Reported to be the first displacement-type meter for 1000 psi take-off service.

Description: "No. 2 $\frac{1}{2}$  Rock-



Displacement-type gas meter well" weighs 950 lb. Capacities are up to 46,000 cfh of gas (on 4 oz basis).

Source: Rockwell Mfg. Co., Valve and Meter Divs., Dept. CP, Pittsburgh, Pa. . . . or for more information check CP 3025 on handy form, pages 2 and 3.

For more information on product at left, specify CP 3026 . . . see information request blank between pages 2-3.

# REGULATORS

# Spence



## NO. 11 TEMPERATURE REGULATOR—Controls Temperatures of Liquids or Air

*W* *u* *u* *u*  
**4 PLUS VALUES**

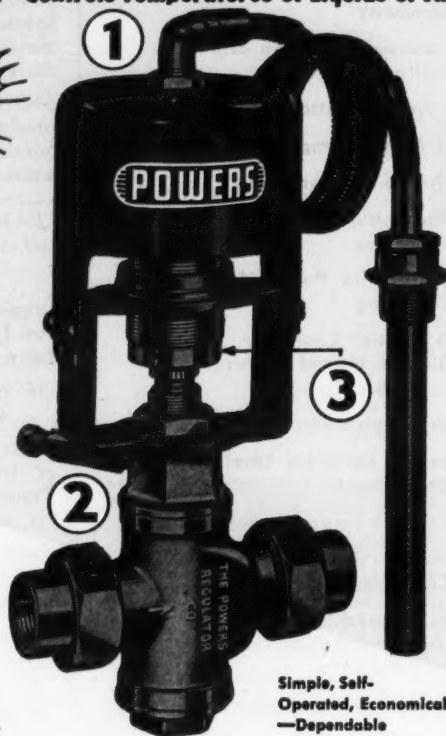
- 1 OVER-heat Protection
- 2 Valve Stem Lubricator
- 3 Temperature Adjustment has OILITE Throat Bearing
- 4 Indicating Regulator Available



*Give*

**BETTER TEMPERATURE CONTROL**

**and Extra Years of Dependable Service**



Simple, Self-Operated, Economical—Dependable

### OFTEN PAYS BACK ITS COST SEVERAL TIMES EACH YEAR

When you want a simple dependable control to maintain a constant uniform temperature install a Powers No. 11 Regulator.

### PREVENTS OVER-HEATING—SAVES FUEL and LABOR

### HELPS INSURE A UNIFORM PRODUCT • MANY GIVE 10 to 25 YEARS OF SERVICE

For valuable aid in selecting the proper type and size of regulator take advantage of our 59 years of experience. Contact our nearest office or write to • **THE POWERS REGULATOR CO.**, 2756 Greenview Ave., Chicago 14, Ill. • 231 E. 46th St., New York 17, N. Y. • 1808 W. Eighth St., Los Angeles 5, Cal. • 195 Spadina Ave., Toronto, Ont.

WRITE FOR BULLETIN No. 329

THE POWERS REGULATOR CO., 2756 Greenview Ave., Chicago 14, Ill.

Gentlemen: Please send me Bulletin 329. Am interested in control for.....

Name.....Title.....

Firm Name.....

Address.....

A-11F

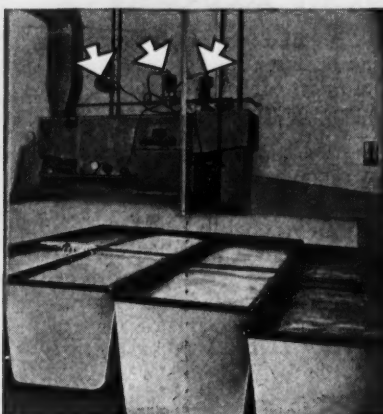


### NO. 11 INDICATING REGULATOR

Has 4" Thermometer dial mounted on top of regulator. Both thermometer and bulb operate from same thermal system. Only one tapped opening required. Gives visual check on performance of regulator. Makes it easy to adjust for the right temperature.

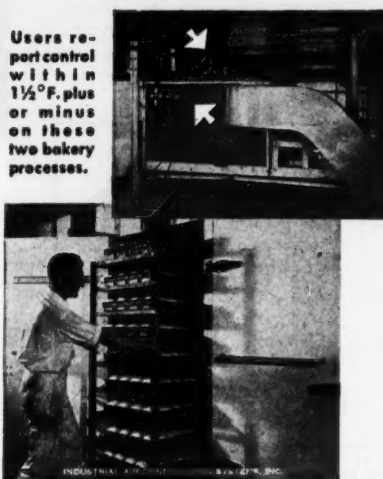


For WATER HEATERS and HEAT EXCHANGERS



For Air Conditioned Bakery Fermentation Rooms

Users report control within 1½°F. plus or minus on these two bakery processes.



For Air Conditioned Bakery Proof Boxes, above. Below: Ham Cooking Vats



## PROCESS INSTRUMENTATION

### NBS finds volume dilatometer aids phase-change research for liquids and solids...

technique improvements, apparatus simplification permit using, making instrument in any lab

**Uses:** NBS finds the simple, inexpensive volume dilatometer a useful research tool, not only for obtaining data on volume coefficients of thermal expansion, but also for studying phase changes in solids and liquids.

**Features:** Application of volume dilatometry at the Bureau (over past 15 years) has resulted in improvements in technique and in simplification of the apparatus to such an extent that accurate dilatometers can now be made and used in almost any small laboratory.

Expansivity investigations on liquids show that the volume dilatometer has a precision of about one percent.

**Description:** Primarily, the volume dilatometer measures the change in volume of a sample as it undergoes a change in temperature. Secondary importance lies in the discovery of phase-changes and other transitions.



Simple volume dilatometer designed and tested by NBS has been found useful for studying volume coefficients of thermal expansion, phase changes, and other transitions in liquids and solids. (LEFT) Two dilatometers mounted with auxiliary equipment (heating element, stirrer, plus bath and air thermometers) ready for immersion in water bath. (CENTER) Similar set-up showing heating and stirring-speed controls; Dewar serves as bath container. (RIGHT) Materials for constructing dilatometer include uniform-bore glass capillary and 20 mm glass tube

tions. Thus, if the density or volume of a substance is plotted as a function of the temperature, there will be irregularities in the otherwise smooth curve wherever there is a change in phase or other transition. Such irregularities represent points at which a change occurs in the structure of the sample, or in types of motion by which it can absorb energy; they may or may not be accompanied by the release or absorption of heat.

Materials for the construction of the instrument consist of glass tubing of any convenient size and a calibrated glass capillary. The confining liquid may be mercury or any other substance which has a known expansivity and which will not react with the sample. Uniform heating is provided by means of a bath containing alcohol, water, or a high-boiling oil — depending on the temperature range to be studied.

Preparation and operation of the volume dilatometer is briefly: A glass capillary is introduced into the tube, a glass bulb is added, and the tube is sealed. The bulb is used to prevent overheating of the sample during the sealing operation. The dilatometer is then weighed, evacuated, filled with mercury, reweighed, and then placed in a bath. As the bath is heated, the sample expands, forcing mercury up into the capillary where readings can be made. From the known weights and densities of the sample and the confining liquid, the

When inquiring check CP 3027 on handy form, pgs. 2-3

expansivity of the sample can be calculated. Corrections must, however, be applied for entrapped air bubbles, non-uniformity of the capillary, and the thermal expansion of glass.

Source: Summarized from information received from the National Bureau of Standards, U. S. Department of Commerce, Washington 25, D. C. Further technical details are included in Volume Dilatometry, by Normal Bekkedahl, J. Research NBS 43, 145 (1949) RP 2016.

**No power wasted in temp control of electrically heated equipment . . .**

input controller automatically proportions the time supply current is "on" or "off"

Uses: Can be set up for sensing and ultimately controlling the temperature in such electrically heated equipment as furnaces, ovens, pots, melters, roasters, press platens, heaters and kettles by automatically proportioning the time the supply current is "on" or "off".

Applicable to burst-firing temperature control, in radiant-tube furnaces for example, by effecting timed periods of valve position.

May be employed for controlling the flow of solid materials on conveyors and in hoppers by actuating solenoid-operated vibrators.

Features: With current either "full-on" or "full-off" for various periods of time, all electrical power is utilized for

heating—no power is wasted as with rheostat- or transformer-type controls. Over-shooting operating temperature is entirely minimized by the controller.

Description: Operation of the "Atoctronic" Input Controller makes use of a Wheatstone bridge circuit—one slidewire is located in a pyrometer and the other in the Controller. Varying temperatures cause unbalance in this circuit, changing the rate of charge and discharge of a capacitor. This action in turn actuates relays or switches that ultimately regulate heating circuits of heated equipment.

Ability to operate with a very narrow proportional band (2% in some cases) eliminates set-point shift with varied load changes.

Type 4702-A Controller incorporates a snap-action switch whose rated loads are: 10 amps @ 115 volts, 5 amps @ 230 volts AC—non-inductive, 25, 50, or 60 cycles. Type 4702-B incorporates a mercury switch relay rated at 30 amps @ 115 volts or 20 amps @ 230 volts with same current characteristics.

Full particulars are included in maker's Bulletin J-40.

Source: Product of Automatic Temperature Control Company, Inc., Dept. CP, 5200 Pulaski Ave., Philadelphia 44, Pa. . . or for more information check CP 3028 on handy form, pages 2 and 3.

FEBRUARY, 1951



Temperature controller makes use of time-proportioning principle



No. 1615 Diaphragm Valve Iron Body, Neoprene lined

**It costs more to fix piping now!**

**You do less fixing by using Dependable Quality CRANE VALVES**

*.. That's why more Crane Valves are used than any other make*

**better performing diaphragm valves**

Separate disc and diaphragm design distinguishes these Crane Valves from all similar packless types. Life of diaphragm is multiplied because it's used only to seal the bonnet—not for seating. The separate disc seats the valve, eliminating wear and tear on the diaphragm.

Increased flow capacity . . . reduced flow resistance . . . tighter seating . . . lower torque and fewer turns to operate . . . are typical added features of Crane Diaphragm Valves. Wherever you use them, you can be sure of outstanding performance.

Such better quality and greater dependability mark Crane valves and fittings of every type—and assure the lowest ultimate cost.

**CRANE**

**VALVES • FITTINGS • PIPE • PLUMBING • HEATING**

CRANE CO., General Offices:  
836 S. Michigan Ave., Chicago 5, Ill.  
Branches and Wholesalers Serving All Industrial Areas

When inquiring check CP 3029 on handy form, pgs. 2-3

**SLASH** batching costs...  
improve your production



Blenders, batchers, processors in the chemical, drug and food industries find Empire meters provide exact control over the liquid content in each operation. They speed production, stop spillage and permit a closed piping system that prevents contamination, evaporation and reduces fire

hazards when handling volatile liquids.

Empire meters are cutting the costs of measuring over 50 liquid commodities. They work silently, accurately at a surprisingly low cost. What do you want to measure? Send the coupon for full details.

USE THIS  
HANDY COUPON

ROCKWELL MANUFACTURING COMPANY  
400 N. Lexington Avenue  
Pittsburgh 8, Pa.

Gentlemen:  
I am interested in using Empire meters to measure \_\_\_\_\_  
(Name of liquid)

Pipe size \_\_\_\_\_ Working Pressure \_\_\_\_\_ psi Temperature \_\_\_\_\_ ° F. max.  
Max. Flow Rate \_\_\_\_\_ gpm Min. Flow Rate \_\_\_\_\_ gpm

YOUR NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
STREET \_\_\_\_\_  
CITY \_\_\_\_\_

ROCKWELL

**Empire Industrial Meters**

ANOTHER PRODUCT OF  
**ROCKWELL MANUFACTURING COMPANY**  
PITTSBURGH 8, PA.

When inquiring check CP 3030 on handy form, pgs. 2-3

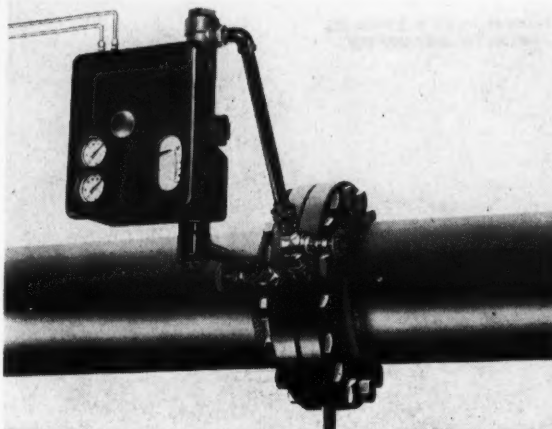
## PROCESS INSTRUMENTATION

**For flow metering service on liquid, gas streams...**

transmits proportional air pressures to such receivers as recorders, controllers, and indicators

**Uses:** Direct-connected differential pressure instrument for converting mainline flow into proportional air pressure (3-15 psi) and transmitting this air pressure to remotely located receiver instruments such as recorders, controllers, or indicators. Applicable to services on liquid, gas, and vapor streams (including steam). Usable flow range is up to 10:1 (ratio of maximum to minimum) at 200" differential. Differential pressure range is from 50 to 1400" of water.

**Features:** Some of the highlights of the "V/A Cell" Kinetic Manometer include easily adjustable range. . . no



Measures and indicates flow, then transmits proportional air pressures to remote receiving instruments

limit on over-range up to full static pressure rating. . . linearity of transmitted pressure with flow. . . built-in direct-reading flow indicator and air supply and output pressure gauges.

**Description:** All parts of the instrument in contact with fluid being measured are constructed of 316 stainless steel. Air supply required is 17-22 psig; air consumption is 0.3 cfm. Maximum operating temperature is 350°F. Instrument can be mounted at the orifice flange, or up to 60' away from it.

**Source:** Development of the Fischer & Porter Company, Dept. CP, Hatboro, Pa. . . or for more information check CP 3031 on handy form, pages 2 and 3.

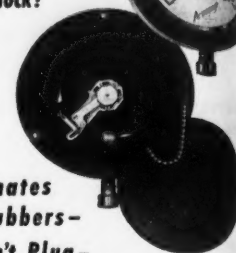
### **Specifies ball joints for pipe lines**

Flexible ball joints are described and illustrated in 16-page, 2-color catalog. These versatile pipe fittings basically consist of a short pipe nipple terminating in an enlarged hemispherical section or ball which is housed inside an outer casing between two molded gaskets. This construction permits rotation as well as side flexing of the ball part in any direction up to 40°.

The joints are commonly used to overcome piping misalignment, to allow for settling or movement of piping, to guard against vibration or shock, to permit movement of loading or unloading lines, and for many other applications. They are available in 12 styles and 15 different sizes, from 1/4 to 12", with a choice of 7 different service specifications and 6 different metals for handling temper-

## ACRAGAGE Shockstop

**Protects against Pulsation and Shock!**



**Eliminates Snubbers - It Can't Plug -**

The Most Significant Pressure Gauge Development in 50 Years.

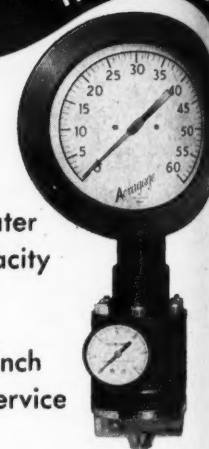
For the first time, a successful means of eliminating the effect of pulsation and shock on pressure gauge mechanisms has been developed which DOES NOT introduce an orifice or restriction in the pressure connection.

**It Can't Plug**

FOR COMPLETE INFORMATION,  
WRITE FOR CATALOG C-50-F

**ACRAGAGE CO.**  
Formerly Clapp Instrument Co.  
MILFORD, CONN.

## ACRAGAGE PNEUMATIC TRANSMITTER



• Greater Capacity

• A Cinch to Service

**"The Solid Front Acragage and the Moore Transmitter"**

FOR COMPLETE INFORMATION,  
WRITE FOR CATALOG C-50-F

**ACRAGAGE CO.**  
Formerly Clapp Instrument Co.  
MILFORD, CONN.

When inquiring check CP 3052 on handy form, pgs. 2-3

CHEMICAL PROCESSING

atures from -50° to 1000°F, pressures from vacuum to as high as 750 psi steam or 6000 psi hydraulic, and virtually all acid and alkali conditions.

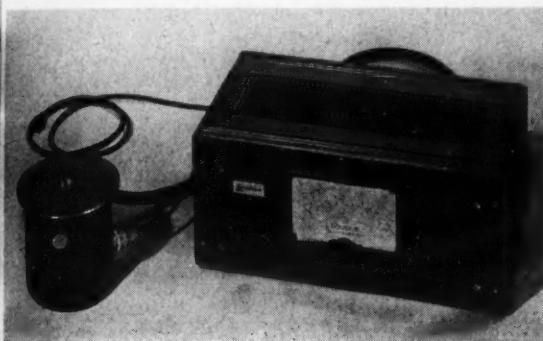
Comprehensive catalog contains complete specifications, dimensions, and application data for the entire line. Catalog 215 is issued by Dept. J-17, Barco Manufacturing Co., Dept. CP, 1801 Winnemac Ave., Chicago 40, Ill. When inquiring specify CP 3033 on handy form, pages 2 and 3.

**Measures small direct currents, voltages in high-resistance circuits . . .**

electrometer has fast response and stable calibration; dynamic condenser eliminates amplifier zero-drift

**Uses:** For measurement of small direct currents and voltages in high-resistance circuits. Physical applications include radiation measurements (ionization chambers), nuclear research, and monitoring. Chemical applications include pH measurements, electrometric titration, biological potentials, micro-analysis, and spectrometry.

**Features:** Calibration stability and high response speed are reported for the instrument. Zero-drift in the amplifier is eliminated by use of a dynamic condenser



Electrometer designed for nuclear research work

which converts the DC input to an AC signal. High amplifier gain and high feedback ratio make calibration independent of component changes and supply voltage variations.

**Description:** "Model 361-20 Dynamic Condenser Electrometer" has voltage ranges of 0-10, 0-100, and 0-1000 millivolts with a range selector switch. Multiple input resistor ( $10^9$ ,  $10^{10}$ , and  $10^{11}$  ohms standard, with others available) and selective switching and grounding key are built into the head. Provision is made for current, voltage, and rate of charge measurement. Terminals are provided for the connection of standard recorders.

Sealed head unit containing the input circuits and pre-amplifier can be located at the amplifier or remotely. A removable top plate provides for easy mounting of ionization chambers. Dynamic condenser is located in a separate hermetically sealed inner shield. All high impedance surfaces, including the dynamic condenser plates, are gold plated to minimize contact potential problems.

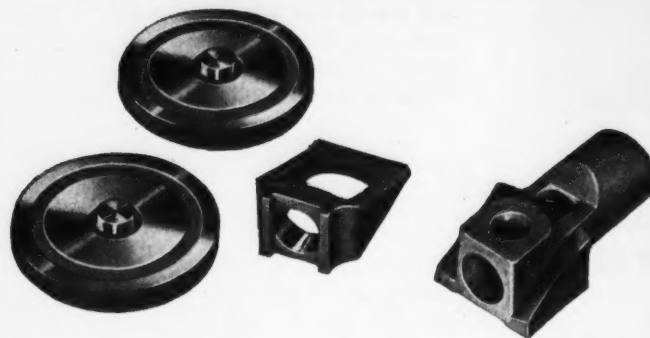
Accessories are available for complete measuring systems, such as ionization chambers, input switches, and recorders.

**Source:** Model 361-20 is a product of Loudon Instruments, Inc., Dept. CP, 5644 Lake Park Ave., Chicago 37, Ill. . . . or for more information check CP 3034 on handy form, pages 2 and 3.

FEBRUARY, 1951

## How Darling features prevent trouble and expense

# Simplified Maintenance



**D**ESIGNED for extreme simplicity, with all parts interchangeable, Darling Fully Revolving Double Disc Parallel Seat Gate Valves assure easy inspection and unsurpassed maintenance economy.

There they are—just four simple gate parts, two plain discs and two wedges . . . readily and quickly removed or replaced as a unit, without disturbing the valve body. Moreover, since the discs are entirely independent and interchangeable, new discs can be installed without laborious bench work or fitting. Likewise, seat rings are made with lugs for easy removal and replacement without removing the valve body from the line.

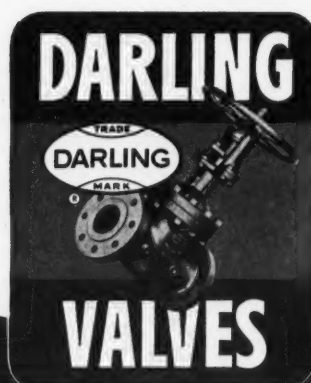
Extra deep stuffing boxes provide ample packing space. Independent gland bolts permit adjustment or replacement of packing without disturbing the stuffing box bolts.

Finally, all Darling Gate Valve parts are made to established engineering standards, beginning with rigid metallurgical specifications, then controlled all along the way with gauges and templates for complete dimensional accuracy.

So for low maintenance cost and minimum parts inventory, for long-range economy in every way, specify Darling Fully Revolving Double Disc Parallel Seat Gate Valves.

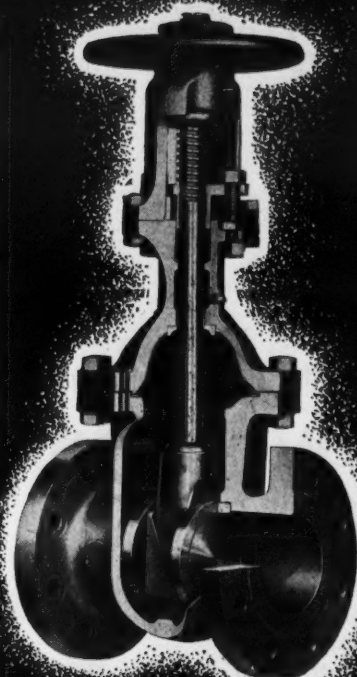
**DARLING VALVE & MANUFACTURING CO.**

Williamsport 4, Pa.



Outline your service requirements and get complete information on Darling Valves of the proper type. Or, send for the complete 300-page Darling Catalog No. 17M. It describes Darling Valves of all types for every normal or unusual service, and for pressures up to 1500 pounds. It's full of helpful information . . . Yours for the asking.

THE VALVE MARK OF QUALITY . . . WATCH FOR IT



\*This advertisement is one of a series showing how the unique Darling Fully Revolving Double Disc Parallel Seat Gate Valves answer the following critical operating problems:

- Positive, easy closing—regardless.
- Automatic adjustment for valve body distortion.
- Elimination of disc-to-seat friction and galling.
- Uniform wear distribution.
- Extreme simplicity.
- Greater service life.
- Simplified maintenance.

### CORROSION RESISTANT VALVES

In addition to conventional iron, bronze and steel constructions, Darling specializes in valves for any corrosive fluid: iron body valves with special alloy trim; iron body, rubber lined, with special alloy trim; all bronze; and all special alloy. Darling's 50 years of experience in meeting unusual requirements is always at your service.

When inquiring check CP 3035 on handy form, pgs. 2-3

# SAVE MONEY

in your plant



with this lightweight, aluminum-alloy  
**Handy-Handler CONVEYOR**



- Aircraft-quality aluminum-alloy construction • 14-gauge aluminum trough actually thicker than 16-gauge steel • Rubber belt with rubber flights or No. 45 steel link chain with plow-contour rubber flights • Deep flared sides, 6 1/4" trough • Replaceable trough assembly • Standard 16-ft. length increases with 4-ft. midsection. • Easily removable motor mount and detachable hopper sides.

FOR ODD JOBS  
or the  
PRODUCTION LINE

Regardless of the  
size of your plant  
you'll find a spot  
where this one-  
man conveyor can  
save you all kinds  
of time and money.



Unloading box  
cars or hopper  
cars.



Portable conveyor line.



Feeding material  
to conveyor line.

Loading trucks and  
other equipment.

The standard 16-ft. length weighs only 92 lbs. with quick-detachable power unit removed; approximately 150 lbs. with 3/4-HP electric motor.

Investigate possibilities in your plant today.  
Write for price schedule and free literature.



**THE BELT CORPORATION**

7404 STAHL ROAD

ORIENT, OHIO

PATENTS PENDING

When inquiring check CP 3036 on handy form, pgs. 2-3

Page 66

## Cut Time to "Pick" and Ship Out Orders from 5 Days to Only 4 Hours

Fork trucks tier 500 different items in palletized units from which orders are picked, placed on dragline cars

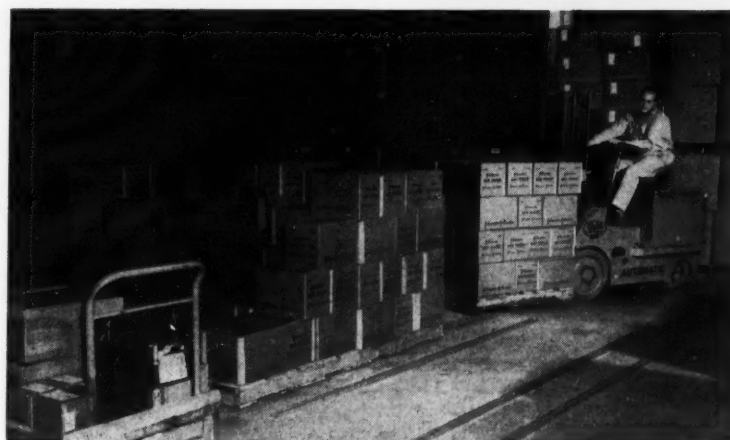
**PROBLEM:** Johnson & Johnson, New Brunswick, N. J., required expanded facilities to handle shipment of some 500 different items. Existing shipping department was spread over several buildings, none of which had been designed to house a modern material handling system. Various difficulties, intensified by increasing volume, had lengthened interval between receipt of orders and final shipment to as much as five days.

Multiple handling of goods in order picking and packing slowed operations. Workers were also obliged to lift and carry loads considerable distances. In addition, an excessive amount of super-



Tiering unit load of cartons of baby powder to third level in reserve storage area

Fork truck brings needed supplies to active area where orders are picked and moved on dragline trucks like that at right



vision was required in an effort to prevent bottlenecks. This was not always possible and goods moving along order and packing lines piled up. Some jobs, as performed, required an excessive amount of time. Typical of these was labeling cartons and cases.

**Solution:** A new shipping center building was constructed on a 58 acre site, set back from the highway. For maximum efficiency, total palletization of loads is

considered essential. All goods arriving from the company's producing plants are placed on pallets. These go either to an active or reserve area. Shipping area occupies 180,000 of the building's 207,000 sq ft. Reserve section occupies most of remaining space.

Loading is done from active stock, except when a pallet load or more of an item is required. Of the 500 different items, all but 65 or 70 are kept on the order packing floor.

Order picking is simplified by a pair of parallel draglines, one for outgoing railroad cars, the other for highway trucks. Four wheel dragline cars used (see illustration) are a development of Erne J. Leger, general traffic manager who is also in charge of shipping center operations. The two lines run in between and around loads of active goods, and the cars are loaded by order pickers. Cars, carrying the completed orders, go to the end of the

CHEMICAL PROCESSING

Material  
Handling

route for emptying. There, everything is checked for accuracy and condition prior to shipment.

To keep this system operating smoothly and without any interruptions, active supply must be maintained at proper level constantly. Reserve, too, must be replenished.

For this service a fleet of six 2,000 lb electric fork trucks are used. Should active supply of an item be depleted some dragline cars would reach the end of the line with certain orders incomplete and time would be wasted in completing it.

Incoming palletized stock is picked up at the drop area, sped to the proper bay in the reserve section and tiered. From there it is moved to active storage as needed. Pallets on the active floor are lined three deep on steel runners that protect the floor (see illustration). When bringing up fresh loads to the order picking floor, trucks put fresh loads at rear of bay so that other pallets are shoved forward to the dragline. This permits rotation of finished goods which is often a difficult operation to handle.

An adjustable hydraulic dock board with 14" of play forward and backward and 16" in the vertical plane also speeds operations. All trucks are equipped with this innovation which is also an invention of Mr. Leger.

The greatest distance a dragline truck has to be pushed is 12'. Once pushed onto the dragline, trucks are picked up automatically and carried along at a constant, but adjustable speed. They are disengaged from the line merely by kicking a bumper.

In line with the general speed-up and smoothing of operations is improvement in labeling boxes. This is accomplished by a special hand label applicator by which preprinted labels can be slapped onto cartons in a single rolling motion of the hand.

**Results:** A typical order is now handled in 67 minutes, 31 of which are for paper work. It actually ships out of the plant within four hours of receipt in contrast to the five days formerly required. New center handles shipping for the company's New Brunswick plants in half the space formerly used. Supervision problems have been reduced 90%. Physical load has been taken off employees. Now, at no time does an employee have to lift or carry anything more than 4'. Also, the greatest distance a dragline truck has to be pushed is 12'.

Trucks handle day's receipts of over 300 pallets a day, while the dragline handles 41,000 cartons daily.

**Source:** Fork trucks used in the mechanized system are built by Automatic Transportation Co., Dept. CP, 149 West 87th St., Chicago 20, Ill. . . or for more information check CP 3037 on handy form, pages 2 and 3.

#### **Presents full information about speed controllers**

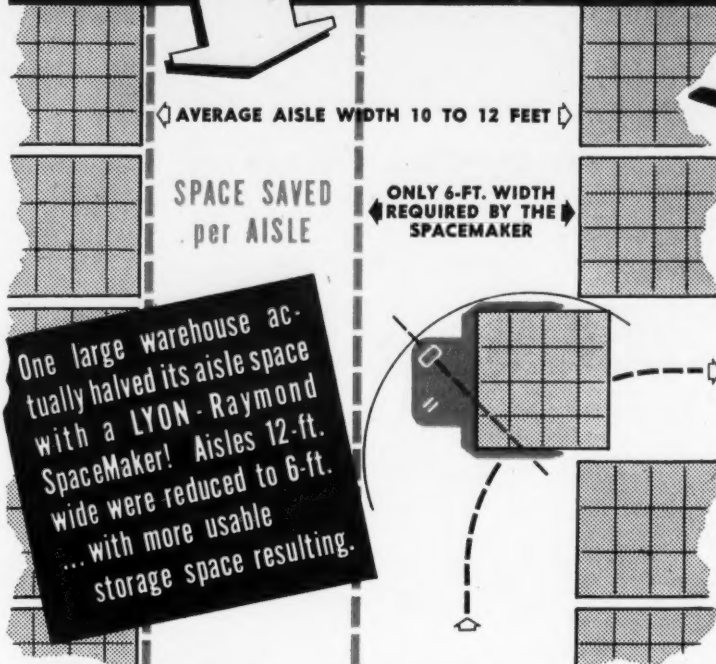
Three separate lines of speed controllers are described and illustrated in 3-color, 12-page bulletin. Transmission provides control at ratios from 2:1 to 16:1 in sizes to 87 hp. Motordrive combines motor, pulleys, and reduction gears in single unit providing variation at ratios from 2:1 to 10:1 in sizes to 20 hp. Motor Pulley is for use with any standard constant speed motor, transmits to 10 hp at ratios from 2 1/4:1 to 4:1.

Also describing controls, speed indicators, and counter-shaft units, Bulletin G-509 is issued by Reeves Pulley Company, Dept. CP, Columbus, Ind. When inquiring specify CP 3038 on handy form, pages 2 and 3.

FEBRUARY, 1951

# ... **SIX FEET IN EVERY AISLE** ...

with the **LYON-Raymond**  
**SPACEmaker**  
ELECTRIC TIERING TRUCK



**Now ... right in your own plant or warehouse ... you can make comparable savings in costly floor space with a LYON-Raymond SpaceMaker.**

This new tiering truck is so compact in design, it actually right-angle tiers 4-ft. pallet or skid loads from aisles only 6-ft. wide. Think what this means in increased storage capacity without enlarging your present facilities! The reason is found in these LYON-Raymond engineered features:

#### **SHORTER LENGTH**

SpaceMaker design eliminates counterweight . . . shortens overall length . . . lets it right-angle tier in aisles narrower than its own length with load.

#### **MAGIC MANEUVERABILITY**

Offset drive wheel produces turning arc of 200° . . . enables SpaceMaker to maneuver like magic!

#### **LIGHTER WEIGHT**

Compact size of SpaceMaker reduces battery capacity requirements and operating costs . . . permits use in low-capacity elevators and on lighter-capacity floors.

### **LYON-Raymond Corporation**

Skid and Pallet Lifts • Hydraulic Elevating Equipment  
Electric Power Trucks • Positioning • Sheet & Die Handling

#### **SPACEmaker** MODEL E2ST

Straddle Type, Telescopic Tiering Truck, 2000-lb. Capacity. Also available in Non-Telescopic Model E2S.

PATENT APPLIED FOR

**Get the full facts** — on the LYON-Raymond SpaceMaker—write for Bulletin 701 today. Available in models for single- or double-face pallets and skid platforms.

**LYON-Raymond Corporation**

5735 Madison St., Greene, N. Y.

Gentlemen: Please send me Bulletin 701 on your new SpaceMaker Electric Tiering Truck.

NAME .....

COMPANY .....

STREET .....

CITY .....

STATE .....

When inquiring check CP 3039 on handy form, pgs. 2-3

how to eliminate  worry and

big  expense in gasholder operation


Does winter  mean sending crews  to the top of



your gasholder  to chop it free? Or filling a huge reservoir with expensive

anti-freeze?  Does summer  mean constant replacement of water 

or other sealant? With a Wiggins Gasholder none of these expenses is necessary!

The Wiggins Gasholder

is not affected by cold  by

heat , by ice , snow, rain or even earthquakes. The entire space

 is used for storage. Gas is delivered  dry, pure,

undiluted because of the absolutely dry, frictionless seal  which is inert to

gas action—and cannot evaporate, freeze or blow out. This seal principle has proved itself

in 15 years' service in the field. Safe storage at pressures up to 20" of water .

What's more, you can convert your present gasholders to many of the patented Wiggins

advantages: safety , economy , and  simplicity.

**GENERAL AMERICAN TRANSPORTATION CORPORATION**

135 South LaSalle Street, Chicago 90, Illinois

District Offices: Buffalo • Cleveland • Dallas • Houston • Los Angeles • New Orleans  
New York • Pittsburgh • St. Louis • San Francisco • Seattle • Tulsa • Washington

Export Dept., 10 East 49th Street, New York 17, New York

TRADE MARK

Send now for  
full data on  
the Wiggins  
Gasholder.

## MATERIAL HANDLING

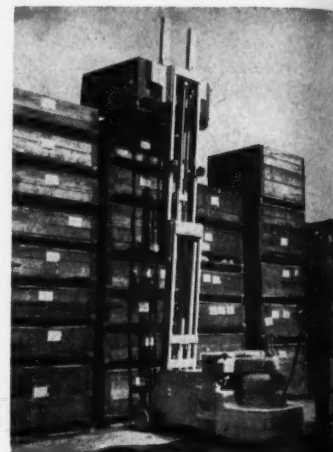
### Line of fork trucks has 6 models . . .

three lift 2000-lb, 48" long loads  
others lift 2500-lb, 48" loads

**Uses:** Line of 6 driver-lead fork trucks. Trucks are battery-powered, suspended fork type.

**Features:** Line is redesigned for shorter length, lighter weight.

**Description:** Three trucks lift 2000-lb, 48" long loads. One is tilting and telescoping type; second



Model SCLT stacks to 131 inches

tilting, non-telescoping; third is non-tilting, non-telescoping. Three similar models are rated for 2500-lb loads, 48" long.

**Source:** Series 101 fork trucks are made by Automatic Transportation Co., Dept. CP, 149 W. 87th St., Chicago, Ill. . . . or for more information check CP 3040 on handy form, pages 2 and 3.

### Truck motive power service is function of batteries

Catalog describing performance and construction of storage batteries for material handling and haulage vehicles consists of information booklet and 5 data pages, the latter listing specifications of batteries, accessories, and miscellaneous parts. Information booklet contains detailed description of batteries and their features, and includes long-term service records to show durability over extended periods.

"Ironclad Batteries for Motive Power Service" is issued by The Electric Storage Battery Company, Dept. CP, Philadelphia 32, Pa. When inquiring specify CP 3041 on handy form, pages 2 and 3.

For more information on product at left, specify CP 3042 . . . see information request blank between pages 2-3.

**Move, spot cylindrical loads with rotating fork truck lamp attachment . . .**

**Uses:** For rapid handling of rolls of paper, and other cylindrical objects, moving them in and out of box cars and storage areas. Accessory is only for maker's line of work trucks.

**Features:** Loads may be rotated 360° in either direction. Loads can be picked up from either a vertical or horizontal position and deposited in either position.

**Description:** Clamp consists of one stationary arm and one hydraulically operated arm which moves laterally from the fully closed position of 29" to fully opened



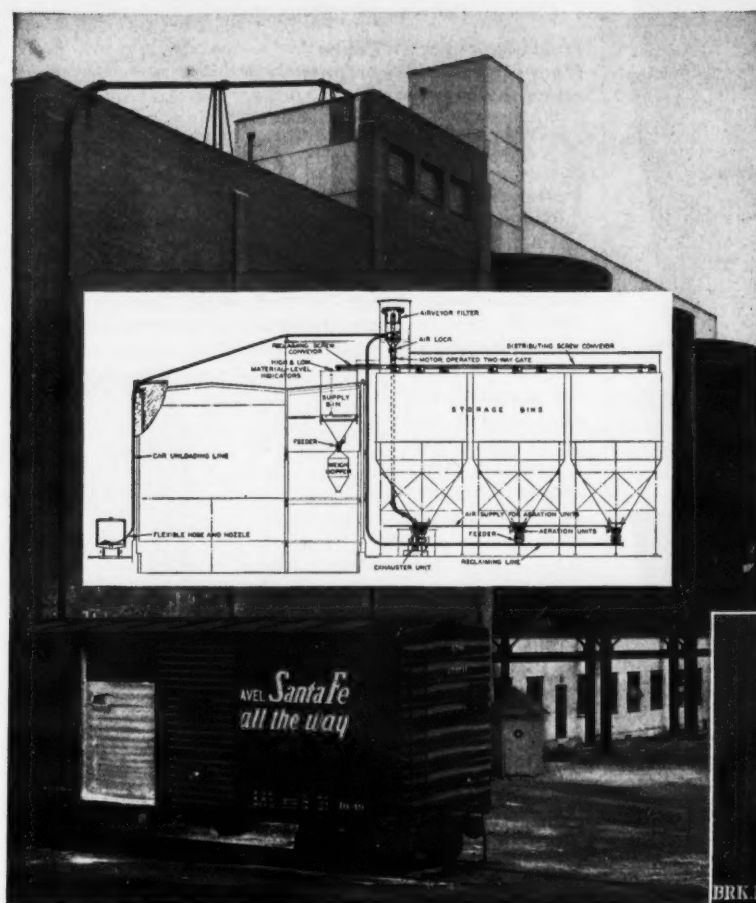
position of 45° between the pivoted clamping shoes. Opening and closing of the clamp are controlled by a valve conveniently placed adjacent to operator, and an accumulator valve assures positive retention of the clamping force while roll is being transported.

rotation of load is accomplished by a modified revolving carriage (to which the clamp is attached), the fully revolving action permitting rolls to be handled from either side of truck. Clamp accommodates rolls with minimum widths of 32" and diameters ranging from 40 to 44". Clamp is readily detachable from the rotating head, and an auxiliary carriage for standard pallet forks is available if truck is to be used alternately as a regular fork truck. A similar clamp is available for rolls from 22 to 36" in diameter.

Source: Revolving roll clamp is a development of Lowmotor Corp., Dept. CP, 1226 E. 152nd St., Cleveland 10, Ohio . . . or for more information check CP 043 on handy form, pages 2 and 3.

**ictures, describes belts  
r conveyors, elevators**

featuring illustrations which show all major parts in detail, 8-page catalog section presents line of conveyor and erator belts. Significant data is given. Conveyor and erator belt catalog section is issued by The B. F. Goodth Company, Dept. CP, Akron, O. When inquiring specify CP 3044 on handy form, pages 2 and 3.



**if it's  
pulverized,  
convey it  
pneumatically**



**THE AIRVEYOR®** goes to work  
for the New York & Pennsylvania Company

**Problem:** To install a conveying system for coating clay that would match the efficiency of the expanded and modernized plant at Lock Haven.

**Solution:** Pulverized coating clay, with a moisture content of not over 3 per cent, is pneumatically unloaded from box cars and conveyed to the Airveyor filter for delivery to any one of three storage bins, or direct to a supply bin above a weigh hopper. Unloading rate is 10 tons an hour. The same system reclaims clay from the storage bins and delivers it to the supply bin—by remote control from a centrally located panel board. Provision is made for automatic return of clay to the storage bin, from which it is being conveyed, when the supply bin is full, or to any bin in any sequence when unloading from cars.

If handling of dry, pulverized materials is a major problem to you, look to Fuller for the most economical and practical solution. Fuller specializes in pneumatic methods of materials handling. Today, the Airveyor, and other Fuller Systems, are cutting handling costs, and materially increasing operating efficiency in hundreds of installations. To have a Fuller Engineer survey your present system and make recommendations for modifications places you under no obligation whatever. It's more than likely that the results of his study will point your way to more efficient materials handling at lower operating and maintenance costs.

**FULLER COMPANY, Catasauqua, Pa.**

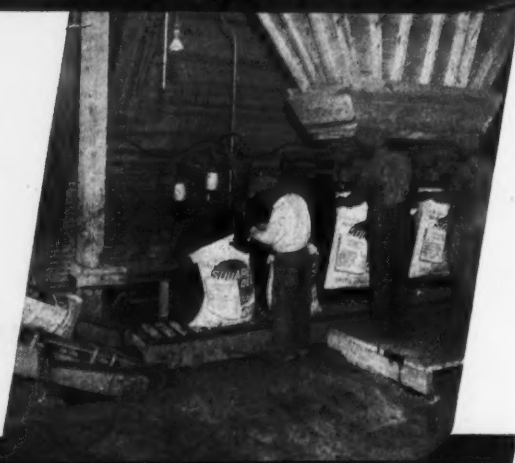
190 S. LaSalle St., Chicago 3 • 420 Chancery Bldg., San Francisco 4

# fuller

**DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—  
COMPRESSORS AND VACUUM PUMPS—  
FEEDERS AND ASSOCIATED EQUIPMENT**

When inquiring check CP 3045 on handy form, pgs. 2-3

## Bag Closing Machines for Every Need . . .



...from UNION SPECIAL'S  
Complete Line! . . .

FOR lower production costs . . . stronger, neater closures . . . ability to get out rush orders in a hurry, you can't beat Union Special Bag Closing Machines! Specially built to stand up under heavy production schedules, these machines provide the high output rates needed to meet modern competitive conditions.

In the Union Special line, it's easy to find the right unit to meet your particular requirements: 25 different styles of machines! 10 styles of sewing heads! For any kind and size of bag—paper, cotton, burlap, or jute. ASK FOR ILLUSTRATED BULLETIN No. 200

SEND FOR THIS  
ILLUSTRATED BULLETIN!



● Get your copy of this 16 page illustrated bulletin presenting helpful data and charts on the complete Union Special line of bag closing machines. Contains information on sewing heads, columns, conveyors, accessories, and overall dimensions, plus more than fifty illustrations of machines and plant installations. Ask for your copy.

**Union Special** MACHINE COMPANY

442 North Franklin St. • Chicago 10, Illinois

When inquiring check CP 3046 on handy form, pgs. 2-3

## MATERIAL HANDLING

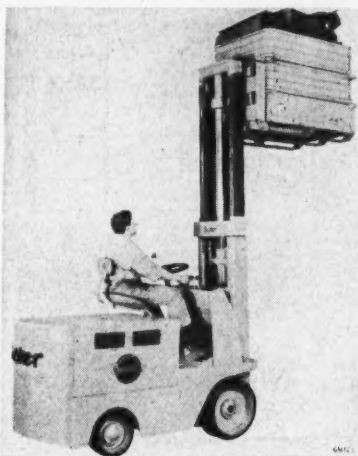
**Truck operator switches  
from high to low uprights  
when loading cars . . .**

unit renders dual service; handles 6,000 lb in warehouse or on shipping platform

**Uses:** For handling loads up to 5,000-6,000 lb in moving them throughout plant and in spotting, storing, tiering, unloading and loading operations.

**Features:** Operator sits on left while driving and, due to cutaway design of dash panel, has an unobstructed view of the ends of forks when engaging a load. Upright and hoist construction is such that there are no chains in the operator's line of vision with load in normal traveling position. Spark enclosed construction is available at extra cost.

**Description:** Truck has 83" overall height, standard telescoping lift being 126". Where overhead obstructions are a factor, 61" of initial lift can be provided. Lift and tilt mechanism is hydraulically operated and employs a low pressure hydraulic system. A unit-welded, deep-section steel plate frame contains an integral hydraulic tank.



Loads and tiers up to 6,000 lb

Pivot, tilt and hose connections are designed so that the uprights can be removed in 20 minutes. This design permits, through the use of two sets of uprights, box car loading and high tiering above the limits provided with 83" of overall height. After tiering to ceiling heights in warehouse work, shorter uprights may be substituted for box car loading.

Wheelbase is 48"; width over drive wheels 39 1/4"; fork length 36"; outside spread 32"; section 6" x 2".

**Source:** Type FT center-control fork trucks are built by Baker Industrial Truck Div., Baker-Raulang Co., Dept. CP, 1250 West 80th St., Cleveland 2, Ohio . . . or for more information check CP 3047 on handy form, pages 2 and 3.

**Use standard electric mechanism  
in pneumatic hoist powered by  
rotary type air motor . . .**

each of 5 models provides pulseless operation, smooth hoisting, lowering of loads to 1 ton

**Uses:** Suitable for handling practically any type of commodity, with its pneumatic principle of operation making it especially serviceable in paint manufacturing, chemical processing, and similar plants where fire and explosion hazards are present. Hoist, in 5 standard models, moves loads in a capacity range of 250 to 2,000 lb.

**Features:** Employs a standard electric hoist mechanism and is powered by a rotary, vane type air motor instead of the customary reciprocating, piston type. Rotor

HERE'S YOUR PARTNER TO  
**BIGGER SAVINGS IN  
PALLETIZING**

**"Weld-Bilt"**  
*Pallet-Type*  
**HYDRAULIC LIFT TRUCK**



**"Weld-Bilt"**  
PRODUCTS

You'll speed up and simplify pallet-moving of materials with the "Weld-Bilt" Pallet Truck! It's built to handle greater variety of single or double-faced pallets easier and faster. Easier on truckers, too.

Check the design and construction of the "Weld-Bilt" and you'll know why. The sturdy forks, with their greased-for-life ball bearing wheels are easier to handle and position under loads of 2,000 and 4,000 lbs. Other features include: Multi-stroke hydraulic lift, accelerator type lowering pedal, "kick-back" safety handle, front wheel equalizer, and many others — all built for longer service, easier operation.

WRITE FOR "WELD-BILT" PALLET TRUCK BULLETIN 1149.

**WEST BEND EQUIPMENT CORP.**  
MATERIALS HANDLING ENGINEERS

319 WATER STREET • WEST BEND, WISCONSIN

PORTABLE ELEVATORS • SINGLE STROKE LIFT TRUCKS  
HYDRAULIC LIFT TRUCKS • TWO WHEEL TRUCKS  
SPRING-BEARING PLATFORM TRUCKS • SKID PLATFORMS

When inquiring check CP 3048 on handy form, pgs. 2

**Screw-Lift**

REGISTERED AND TRADE MARK REG. U.S. PAT. OFF.



Screw-lift provides an effective and economical solution to the receiving, elevating and distributing of your free-flowing bulk materials. It also reclaims from storage bins, delivering to processing machines or baggers.

It's a clean — dust-less way to handle materials and also eliminates degradation or contamination.

Hundreds of installations . . . from flour to chili-powder — dry chemicals — grain — etc. — yours to benefit by. Capacities of 75, 300, 1000 and 2500 cu. ft. per hour.

Ask for form No. M-500-2 to enable you to outline your plans and from which we can quote.

We manufacture a complete line of Buckets and Screw Conveyors, including all accessories.

**Screw Conveyor Corporation**  
699 HOFFMAN ST. HAMMOND, IND.  
ENGINEERS MANUFACTURERS  
TRADE MARK REG. PRODUCTS U.S. PAT. OFFICE

When inquiring check CP 3049 on handy form, pgs. 2

CHEMICAL PROCESSING

## The "MASTER" Line OF MATERIALS HANDLING EQUIPMENT

The Most Complete Line of Materials Handling Equipment on Wheels

*Buy the type of machine  
that fits your job.*



Write TODAY for one or more  
of these new catalogs . . .

- (24) Master JackLift Electric Trucks and JackStacker Electric Trucks.
- (25) SpaceMaster Electric Fork Trucks.
- (26) Master JackLift Trucks, Hydraulic and Mechanical Handlift Trucks, WeldMaster Skid Platforms.
- (27) SpaceMaster Gas Fork Trucks.
- (28) PowerMaster Stackers, Lifters, Handy Hoisters, Portable Cranes.
- (29) FloorMaster Trucks.
- (30) ToteMaster Gas Trucks.
- (31) LoadMaster Racks for Pallet, Platform, Barrel, Drum, Bin, Unit Loads.

The "MASTER" Line

**LEWIS-SHEPARD PRODUCTS INC.**

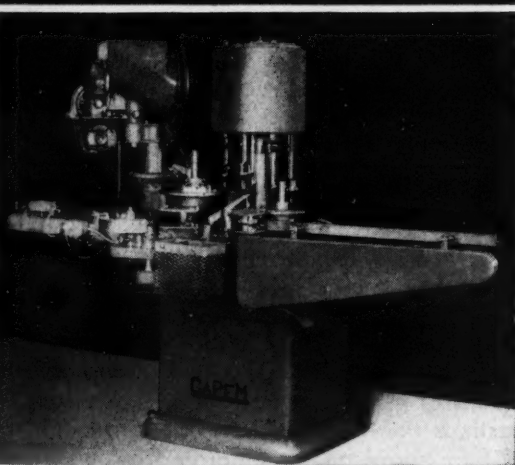
146 Walnut Street, Watertown 72, Massachusetts

Midwest Plant: Crawfordsville, Ind.

Sales & Service in Principal Cities

When inquiring check CP 3050 on handy form, pgs. 2-3

## CAPEM...more in use than any other make of capper



Applies all types of screw caps... Provides a leakproof seal at low cost...  
...Five models with speeds ranging from 2,000 to 10,000 an hour.

Write for information and prices

**CONSOLIDATED PACKAGING MACHINERY CORP.**  
BUFFALO 13, N.Y.

When inquiring check CP 3051 on handy form, pgs. 2-3

FEBRUARY, 1951

## MATERIAL HANDLING

and four sliding vanes which automatically take up their own wear provide pulseless operation and particularly smooth hoisting and lowering of the load hook and load. Hoist is fitted with roller bearings and is a compact, self-contained, entirely enclosed unit.

**Description:** Capacities of the five standard models are 250, 500, 750, 1,000 and 2,000 lb, with corresponding fpm speeds of 80-90, 45-50, 30-35, 25-28 and 12-15. Hook lift is 11' in all instances.

The pendant operated, self-closing air motor control provided on the hoist is simple and unusually sensitive. Hoisting speed can be varied from practically a "crawl" progressively to full speed depending upon the amount of throttle opened. Control casing includes an exhaust muffler.

Hoist is available with hook or monorail trolley suspension. The former arrangement permits moving hoist from job to job. Only two gear reductions are employed in the worm gear drive. This drive provides a self-contained brake that automatically will sustain full load on the hoisting hook as soon as the control valve is closed or if the air pressure is interrupted through other conditions.

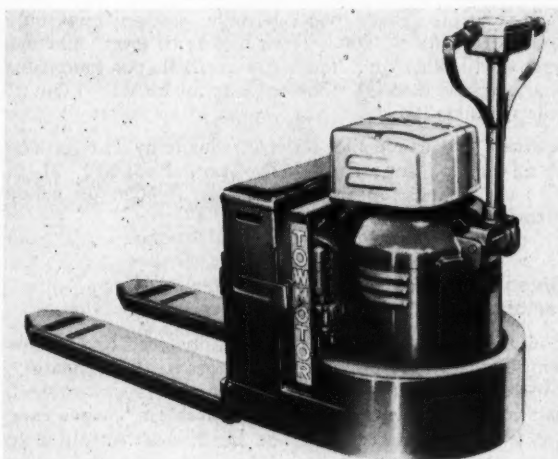
Motor will operate on 80-100 lb air pressure per sq. in. It will also operate on pressures as low as 30 lb, but at reduced capacity and lifting speed.

**Source:** PT hoists are built by Detroit Hoist & Machine Co., Dept. CP, 8231 Morrow St., Detroit 11, Mich. . . . or for more information check CP 3052 on handy form, pages 2 and 3.

### Move 2-ton pallet loads on driver lead truck . . .

compact unit handles easily through narrow aisles  
**Uses:** For handling pallet loads weighing up to 2 tons.

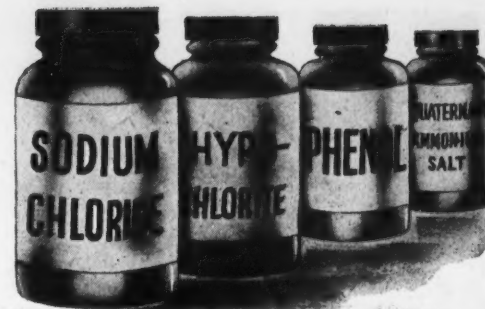
**Features:** Easily maneuverable in close quarters.



Key switch turns off power to dual control buttons

**Description:** Driver lead type, battery powered. Controls located for right or left hand operation.

**Source:** Model W pallet trucks are built by Towmotor Corporation, Dept. CP, Cleveland 10, Ohio . . . or for more information, check CP 3053 on handy form, pages 2 and 3.



## THEY'RE ALL TOXIC IN CONCENTRATED FORM

These and many other chemicals are deadly poisons at sufficient concentration. They are all "hard to take" at toxic strengths, because of taste, odor, etc., yet they will kill, if taken in sufficient quantity at sufficient strength.

However, when the material is used for sanitization, the picture is entirely different.

We confine our comments to four Onyx Quaternaries . . . Onyx BTC\* (alkyl dimethyl benzyl ammonium chloride), Onyxide (alkenyl dimethyl ethyl ammonium bromide), Isothan Q-15\* (lauryl isoquinolinium bromide) and Tetrosan (alkyl dimethyl 3, 4 dichloro benzyl ammonium chloride). Each of these has been thoroughly and authoritatively tested<sup>†</sup> so that we can be sure of our ground:

On an acute toxicity basis, all recommended use-dilutions of 1-1000 or weaker are in themselves non-toxic and non-irritating.

On a chronic toxicity basis, there is no danger of harmful cumulative action of any kind due to repeated ingestion of any residues which might conceivably be added to food products due to poor rinsing of equipment sanitized by working solutions of these quaternaries of 1-1000 or weaker.

When rinsing is thoroughly done, the possibility of harm, even with very widespread use of quaternaries in food equipment, approaches zero!

You can feel safe when you use any one of these Onyx Quaternaries, because they have been proved to be non-toxic both chronically and acutely, non-irritating and non-sensitizing at all use-dilutions of 1-1000 or weaker.

\*Trade Mark Reg. U.S. Pat. Off.

†THE INVESTIGATIONS THAT PROVE THESE STATEMENTS: These tests were conducted by an independent biological laboratory. They include:

- (1) Acute and sub-acute toxicity tests on guinea pigs, white rats and dogs.
- (2) Chronic toxicity tests based on daily ingestion of sub-lethal doses, carried out on guinea pigs for one year, and on white rats for two years.
- (3) Skin irritation and sensitization tests on 200 humans.

**onyx**

INDUSTRIAL DIVISION

ONYX OIL & CHEMICAL COMPANY

184 WARREN STREET

JERSEY CITY 2, N. J.

CHICAGO • BOSTON • CHARLOTTE • ATLANTA

In Canada: Onyx Oil & Chemical Co., Ltd.

Montreal, Toronto, St. John, Que.

For Export: Onyx International, Jersey City 2, N. J.

When inquiring check CP 3054 on handy form, pgs. 2-3



# STOKER

## BAG PACKERS

The "OK" on the Stoker Bag Packer, Model IN, was put there by many of the largest users of packaging equipment in the world—it is now the standard packer for the insecticide industry—but not until production line operation had proved these results:

That Stoker Model IN Packers easily handle 300 fifty-pound bags per hour—actually filling 50 pounds in 6 seconds or less... That there can be no bridging in your hopper or the packer, thus assuring continuous flow... That Stoker Packers fill with unsurpassed accuracy... That the filling operation is virtually free from dust and blow... That one operator in many instances does the work of 3 to 5 necessary with other equipment!

**APPLICATIONS:** Stoker Packers bagging the complete line of insecticides for the past 4 years have demonstrated: (1) That one bag (Size 15-4 1/2-31 with a 5 1/4" tuck-in sleeve valve) will accommodate 50 pounds of all insecticide dusts, making a good-looking package that does not leak, and cutting your bag inventory to the bone. (2) That maintenance expense is so negligible that for all practical purposes there simply isn't any.

**SPECIFICATIONS:** Stoker Packers are delivered as a complete unit, equipped and wired to operate on your voltage and cycle. Simply tie in to your current and push the button—Agitators in

the packer travel back and forth 45 times a minute, eliminating any possibility of bridging—Recommended height above floor, approximately 58"—Recommended height of filling spout, approximately 39"—Inside diameter of top of hopper 24" x 48"—Flange at top of hopper 1 1/2" x 1 1/2"—Speed of filling screw 1500 R.P.M.—Motors are equipped with thermo-overload relay—Shipping wt., approx. 800 lbs.

**ADAPTABILITY:** Some Stoker customers have been packing their products in open-mouth bags or drums. If you have a supply of containers on hand, when changing to valve-type bags, attachments for handling open-mouth bags or drums are available.

**STOKER MODEL 1-S PACKERS:** This Stoker Model is designed to pack a wide variety of hard-to-handle granulated or powdered materials. These machines are now packing materials, some of which are very abrasive, ranging from 10 to 115 pounds per cu. ft. This model is portable when equipped with wheels and lift.

**STOKER TESTING SERVICE:** If you have a particularly difficult filling problem, the Stoker experimental laboratory is available to you without charge. Send us an adequate sample of material to be packed and we will run tests and send you a report with recommendations for the equipment needed to bag your products.

\* **OK** REPEAT ORDERS from such firms as Hercules Powder Co., E. I. duPont de Nemours & Co., Inc., Tobacco By-Products & Chemical Corp., Dow Chemical Company, Swift & Company, and many others whose names will be furnished on request.



111 SOUTH COLLEGE AVENUE, CLAREMONT, CALIFORNIA

When inquiring check CP 3055 on handy form, pgs. 2-3

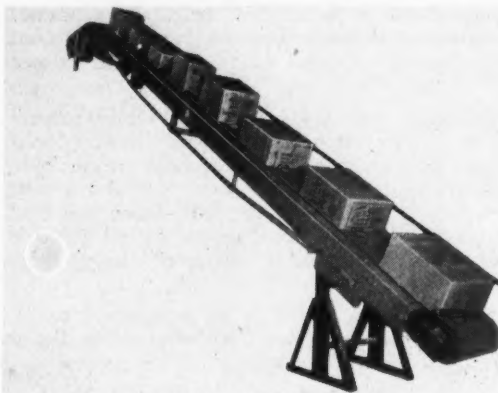
## MATERIAL HANDLING

**Cleats hold goods in place as conveyor moves them at angles to 45°...**

conveyor can often be mounted in ordinary stair well without disturbing normal stair traffic

**Uses:** Reversible belt conveyor for inter-floor applications. Conveyor moves rough or smooth cartons, bags, crates, and other materials at angles to 45°.

**Features:** Conveyor can often be mounted in ordinary stair well without disturbing normal stair traffic.



Cleated conveyor for inter-floor movement of goods

Direction is reversible, and motor switches may be operated from either end of the unit with full-length control bar.

**Description:** Conveyor has 10-gauge steel box-channel bed, rigidly cross-braced and trussed to prevent deflection. Belt widths: 12, 16, 20, and 24"; lengths: from 10 to 40'. Choice of belts and cleat spacing is offered. Motors are available in the 3/4 to 1 hp range. Standard speed is 50 ft/min. Capacity depends on size of motor, bed construction, and operating pitch.

Pulley shafts operate in sealed, self-aligning ball bearings. Triple nosed-over delivery section promotes smooth transfer of goods from incline to level. Several types of brackets and stands are available for mounting in a stairway, through floor opening, or on wall. Guard rails are included.

**Source:** Cleated Floor-Veyor is made by The Rapids-Standard Co., Inc., Dept. CP, Grand Rapids 2, Mich. ... or for more information check CP 3056 on handy form, pages 2 and 3.

## Gives complete specifications for almost 100 welding alloys

Containing complete specifications on close to 100 low temperature welding alloys used in welding, brazing, and hard surfacing of steel, alloy steels, stainless steel, cast iron, brass, bronze, copper, aluminum, magnesium, and zinc, 6-page reference can be filed or unfolded to form 11 x 23" wall chart.

Detailed information is given for each alloy, including composition, heating facilities which can be used, metals on which it can be used, type and preparation of joint, preheating, heat and corrosion ratings, and color match ratings. Reference chart TIS 246 P is issued by Eutectic Welding Alloys Corporation, Dept. CP, 40 Worth St., New York 13, N. Y. When inquiring specify CP 3057 on handy form, pages 2 and 3.



The remarkable  
**BAKER**  
newly designed  
**100% FUNCTIONAL  
FORK TRUCK**  
is now available for

- SIT-DOWN DRIVE!
- STAND-UP DRIVE!
- CAPACITIES OF
- 3000 TO 6000 POUNDS!

A year ago we introduced the new BAKER Type FT Fork Truck in 3000 and 4000 pound capacities. Because of its highly advanced, completely functional design, this truck more than lived up to our claim that it would do more work per dollar invested than any other truck in its class.

The unprecedented acceptance of this truck and the insistent demand from our customers for other types and sizes, have resulted in our expansion of the line to include capacities up to 6000 pounds in both stand-up and sit-down-drive.

Completely descriptive bulletins available. Ask for:  
Bulletin 1321 for the FT (sit-down drive) 3000 to 4000 pounds.  
Bulletin 1322 for the FT (sit-down drive) 4000 pounds.  
Bulletin 1326 for the FC (stand-up drive) 3000 to 6000 pounds.

BAKER INDUSTRIAL TRUCK DIVISION of The Baker-Rauland Company  
1208 West 80th Street, Cleveland 2, Ohio

**Baker INDUSTRIAL TRUCKS**

When inquiring check CP 3058 on handy form, pgs. 2-3



## BLENDING AND SORTING WITH VACUUM

This Spencer Vacuum Producer is located between two huge storage tanks on the roof of a large chemical plant. Dried plastic granules are picked up from the trays with a Spencer "Gulper" tool as they come from the ovens. One tray containing 10 pounds of material is emptied in one minute. The plastic is then conveyed by vacuum to the roof, 35 feet above and is separated by the Spencer Centrifugal Separator and then dropped down over vibrating screens.

150 USES FOR VACUUM...ASK FOR BULLETIN  
THE SPENCER TURBINE COMPANY • HARTFORD 6, CONNECTICUT

**SPENCER**  
HARTFORD

When inquiring check CP 3059 on handy form, pgs. 2-3

## A BETTER, FASTER WAY TO MOVE HARD-TO-HANDLE MATERIALS



### THE HEWITT-ROBINS VIBRA-VEYOR®... Up to 200 Feet of Pan Length on One Vibrator!

Handles anything a belt conveyor can't! Hot or cold, wet or dry, lump or pulverized, packaged or bulk—this Hewitt-Robins Vibra-Veyor moves it horizontally, down-hill, up 10% grades... quickly, quietly, with power-saving efficiency.

Won't bog down, even when loaded to the hilt. Pan sections have soft coil springs that counteract shock loads. Full-floating vibrating mechanism is amazingly quiet.

The Vibra-Veyor is easy to install and maintain. No special foundation needed. Only 4 points to lubricate. Get all the facts. Write for Bulletin 135. Robins Conveyors Division, Passaic, New Jersey.

## HEWITT-ROBINS VIBRA-VEYOR

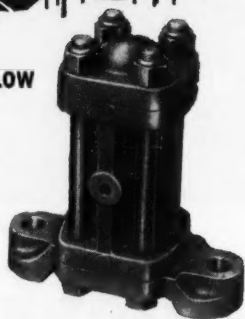
When inquiring check CP 3060 on handy form, pgs. 2-3

## SPO AIR VIBRATORS

### ASSURE POSITIVE MATERIALS FLOW

Bins, hoppers, and chutes handling powdered or granular materials function at peak efficiency when SPO Series 81 pneumatic vibrators are utilized. These dependable, low-cost vibrators deliver hammer-like impacts to prevent clogging or packing, and they assure a positive flow of materials to meet all production demands.

Designed to withstand continual hard usage, SPO vibrators operate on standard line pressures and feature full-power starting, high-speed operation, low air consumption, and a long trouble-free service life.



WRITE FOR BULLETIN 50

FOR COMPLETE DETAILS



New BULLETIN 50 contains data and specifications on standard line of SPO air vibrators.



6531 GRAND DIVISION AVE. CLEVELAND 25, OHIO

When inquiring check CP 3061 on handy form, pgs. 2-3

FEBRUARY, 1951

## MATERIAL HANDLING

### Packages loaded automatically on pallets which rotate 180° to interlock each layer...

loaded pallets removed from machine by conveyor; hand piling eliminated; operation is continuous

**Uses:** Takes packages from conveyor lines and stacks them in interlocking layers assuring a solid pallet load.

**Features:** Machine is almost completely automatic. Selection of package arrangement is accomplished by pushbutton. Hand piling is eliminated.

**Description:** Empty pallets from the pallet magazine are conveyed as needed to the pallet loading area. A hoist carries the pallet to the top of the loader to receive a layer of packages which rest on an apron. The apron is withdrawn from beneath the packages to de-



Pallets automatically loaded, placed on conveyor

posit them on the pallet. The hoist then lowers the layer sufficiently to receive the second layer. As the hoist lowers, the pallet is lowered 180°. Thus, successive layers of packages are interlocked, assuring a more stable pallet load.

When the last layer is deposited, controls automatically start a conveyor that removes the loaded pallet from the machine. Simultaneously, the next empty pallet from the magazine is moved into position. Thirty packages per minute can be handled.

**Source:** Pallet loading machines are built by Alvey Conveyor Mfg. Co., Dept. CP, 3201 South Broadway, St. Louis, Mo. . . or for more information check CP 3062 on handy form, pages 2 and 3.

### Five major features listed for deaerating heaters

Twenty-two-page bulletin fully describes and illustrates line of spray-type deaerating heaters. Heaters are used in power plants, paper mills, oil refineries, steam heating plants, and similar applications.

Five major features are listed for these heaters. Deaeration is accomplished in 2 separate stages. Venting from deaerator stage is exceptionally large; all steam used in heating stage is vented steam from deaerator stage. Final venting to atmosphere is taken only from heating stage, thus reducing steam entering condenser. There is no corrosion or scaling of trays. There is also no corrosion of shell, as water is heated and most of the corrosive gases escape before water comes in contact with shell.

Contents of bulletin include cutaway drawings, full explanation of equipment and component parts, case histories, specifications, and suggested applications. Bulletin 2357 is issued by The Permutit Company, Dept. CP, 330 W. 42nd St., New York 18, N. Y. When inquiring specify CP 3063 on handy form, pages 2 and 3.

## IF WEIGHING, BLENDING OR PROPORTIONING MATERIALS IS IMPORTANT TO YOU...

THIS

# NEW GUIDE

IS

MUST

READING



Richardson's new guide to automatic weighing, blending or proportioning of materials points out *new methods-new equipment applications* in these important processes. Simply find your material in the index, refer to the equipment section and you're on your way to improving your present operations through increased speed, economy and accuracy.

Let Richardson's 50 years of experience in building Automatic Weighing, Proportioning and Blending, equipment help you discover new and improved methods in your field—no matter what you handle.

Write today for your free copy of this guide Bulletin No. 0450.

### RICHARDSON SCALE COMPANY

Clifton, New Jersey

Atlanta • Boston • Buffalo • Chicago  
Cincinnati • Houston • Minneapolis  
Montreal • New York • Omaha  
Philadelphia • Pittsburgh • San Francisco  
Toronto • Wichita

# Richardson

7489

MATERIALS HANDLING BY WEIGHT SINCE 1902

When inquiring check CP 3064 on handy form, pgs. 2-3

**Wearing Parts Made  
in Many Different Alloys  
for Various Chemical Services**

## MORRIS TYPE R SLURRY PUMP

**WHETHER** it's handling a slurry that is highly abrasive only — or one that is highly abrasive and corrosive — it is easy to get just what you need in a Morris Pump. The reason: Morris Type R wearing parts are furnished in various alloys, determined after long experience for particular services.

Here are a few typical examples of "just the right metal for the job" —

- ✓ Morris laboratory-controlled semi-steel. Economical metal for moderately abrasive solids.
- ✓ Three per cent nickel semi-steel or 3% nickel gray iron. For moderately concentrated caustic slurries.
- ✓ Ni-Resist, for more highly concentrated caustic slurries.
- ✓ Morris Flintmetal "S", a hard, straight, high chrome iron, brinelling between 600 and 700. For added corrosion and abrasion resistance to slurries containing traces of sulphuric and sulphurous acid.
- ✓ Carbon steel. For fine materials and high heads, or where an easily welded metal is desired.
- ✓ Various bronze alloys. For added corrosion resistance.
- ✓ Various stainless steel alloys. For extreme corrosion and abrasion resistance.
- ✓ Cast iron, rubber lined. Where operating conditions are right for this construction and when suitable rubber is available.

Handling both liquids and slurries of great variety by centrifugal pumps, has been the Morris specialty for 84 years. Write us for further information on materials, design specifications and operational data on pumps best suited to your particular needs. No charge or obligation.

MORRIS MACHINE WORKS, Baldwinsville, N. Y.  
Sales Offices in Principal Cities

**MORRIS**

**CENTRIFUGAL PUMPS**

When inquiring check CP 3065 on handy form, pgs. 2-3

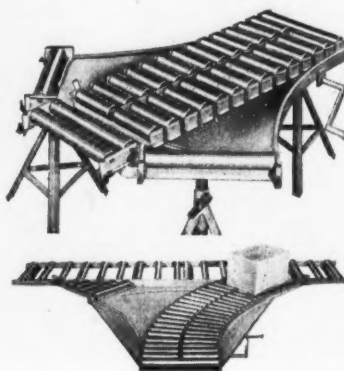
## MATERIAL HANDLING

**Crank-operated switch  
makes straight line,  
45, 90° curves . . .**

often eliminates need for special curved sections, guard rails

**Uses:** Crank-operated gravity conveyor switch for making various combinations of straight sections, 45 and 90° curves to switch over a large fan-shaped area.

**Features:** A popular adaptation (see cut) is that of a "Line-Y" to accomplish 90° switching to a 180°



Note absence of curve sections in "Line-Y" application, below. One of 2 small triangular sections bridging gap between straight section and end of switch can be seen at left

through line without using curve sections. In such applications, small triangular sections are bolted directly to switch platform and line.

Guard rails are eliminated, except for very fast travel.

**Description:** A crank-operated fast traverse, long lead screw replaces the conventional hand-lever adjustment.

The screw operates a lever beneath the steel bed of the switch so that rollers (or wheels), each mounted in individual frame sections, slide on the bed as a flexible unit, to assume desired directional change.

Thus, all axles are concentric at any setting, assuring positive flow. Name: "Flex-A-Switch."

**Source:** Metzgar Company, Dept. CP, 461 Douglas N.W., Grand Rapids, Mich. . . . or for more information check CP 3066 on handy form, pages 2 and 3.

**Pallet handling eased  
in close quarters . . .**

roller handles 3000 or 4000 lb loads, rotates through 360°

**Uses:** Tilt-type roller for moving pallets. Especially useful in refriger-

Save time! Prevent accidents!

**LIFT AND DUMP**  
MECHANICALLY

**BAGS  
BARRELS  
DRUMS  
BOXES**

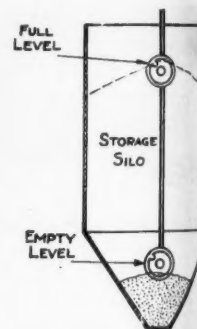
**REDUCE HANDLING COSTS** with a CESCO Dumper. It handles up to 100 loads per hour; has a lifting cap. ranging from 100 to 1500 lbs. Both single- and multi-purpose portable models are built in standard dumping heights from 5 to 12 ft. Stationary models up to 16 ft. dumping heights. Push button controlled. Write for catalog.

**COLSON EQUIPMENT & SUPPLY CO.**  
1317 Willow Street • Los Angeles 13, California



When inquiring check CP 3067 on handy form, pgs. 2-3

**No Spillage  
No Shortage  
of Materials  
in  
Bins, Hoppers,  
etc.  
with**



## SYNTRON HOPPER LEVEL SWITCHES

— automatically maintaining constant full and empty levels of materials — from fine to coarse — in bins and hoppers.

They will start and stop feeders filling hoppers — or ring alarm bells — or turn on lights — from material pressure, or the lack of it.

Write for catalog data.

**SYNTRON CO.**

110 Lexington Avenue

Homer City, Pa.

When inquiring check CP 3068 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## New chemical-resisting linings for drums



No longer need your choice in drums be limited to an ordinary steel drum with the usual protective lining or to one of more costly metals. Now you can have an in-between choice: An ordinary steel drum with the extraordinary protection of Unichrome Series 4000 Drum Lining.

These drum linings were developed to handle many chemicals beyond the ability of conventional linings. They're heavy duty—resist most acids, alkalis, alcohols, salt solutions, and others. They build up thick films. They're flexible. They can take numerous round trips without damage. And your cost is far less than for the scarce alloy metal containers. Ask your supplier if he is prepared to line your drums with plastisol Unichrome Series 4000 Drum Linings.



**UNICHROME**

**COATINGS FOR METALS**

Products of UNITED CHROMIUM, INCORPORATED

140 East 42nd St., New York 17, N. Y. • Detroit 20, Mich. • Waterbury 20, Conn.  
Chicago 4, Ill. • Los Angeles 13, Calif. • In Canada: United Chromium Limited, Toronto, Ont.

When inquiring check CP 3069 on handy form, pgs. 2-3

## New Farval Spray Valve

**METERS LUBRICANTS TO SLIDE SURFACES AND OPEN GEARING**

BY an ingenious adaptation of the familiar Farval Dualine Valve, either grease or oil is sprayed through a nozzle—onto any desired area, in any amount, at any interval.

The new Farval Spray Valve can be added to a regular Farval Dualine Lubrication System wherever compressed air is available—or a complete system of spray valves may be installed, served by either manual or automatic pumping unit.

Farval Spray Valves have been thoroughly tested in service on a wide variety of machines and equipment, supplying lubricant efficiently, economically and safely to open gearing, slide surfaces and other areas where Farval closed systems are not readily adaptable.

For full description with diagrams, get Farval Bulletin No. 60. The Farval Corporation, 3257 East 80th Street, Cleveland 4, Ohio.

Write for this FREE bulletin

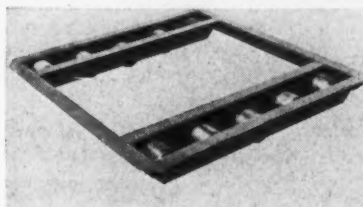


## MATERIAL HANDLING

erator cars, elevators, and other close quarters.

**Features:** Rotates through full 360°.

**Description:** Made of steel alloy with 10 double ball bearing rolls.



Pallet roller turns 360°

Available in 2 capacities: 3000 and 4000 lb. Design has been field tested.

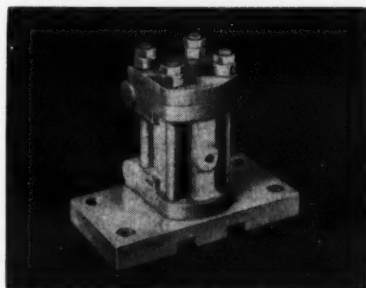
**Source:** Ace Reefer pallet roller is made by Frank L. Robinson Co., Dept. CP, 1706 Broadway, Oakland 12, Calif. . . . or for more information check CP 3071 on handy form, pages 2 and 3.

### Quietness of operation is principal feature of vibrator . . .

maker reports no piston impact, no metal-to-metal pounding

**Uses:** Vibrators for use on bins, hoppers, chutes, shake-outs, and similar equipment.

**Features:** Quietness of operation. Manufacturer reports that there is no impact of the piston on either end,

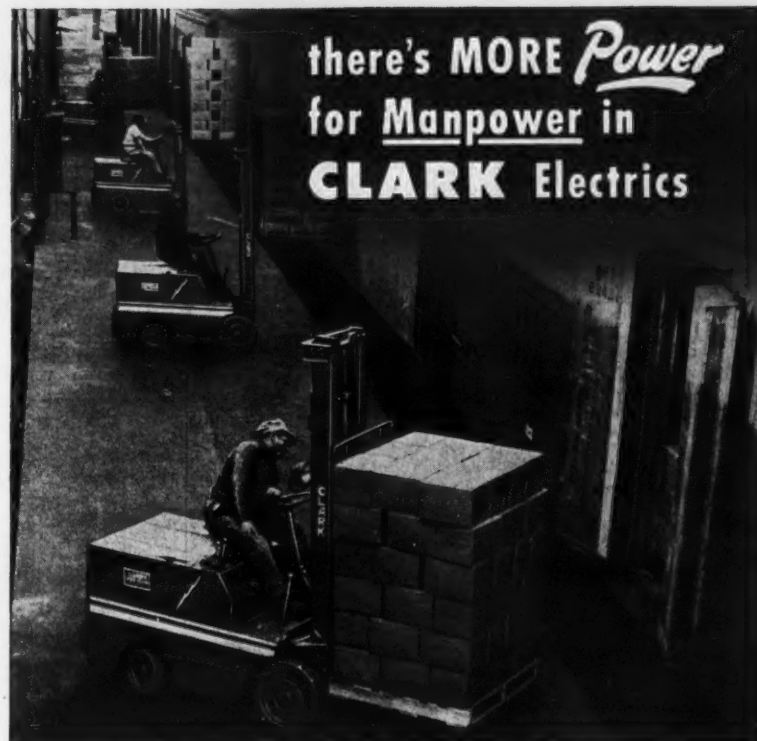


"Quiet Type" bin vibrator

no metal-to-metal pounding, no springs, and no "ear-splitting" noise.

**Description:** Vibrator is furnished in sizes from 1 7/8 to 4", and is interchangeable with any bolted type of vibrator. Breakage of bolts and end plates is "practically eliminated."

**Source:** Style "EM" vibrator is made by Cannon Vibrator Company, Dept. CP, 1108 Power Ave., Cleveland 14, O. . . . or for more information check CP 3072 on handy form, pages 2 and 3.



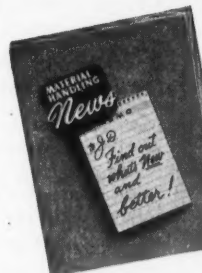
there's **MORE Power** for **Manpower** in **CLARK** Electrics

**Users** OF CLARK ELECTRIC FORK-LIFT TRUCKS are well prepared to meet the twin challenges of labor shortage and increased user demands. They've equipped their manpower with enough more power to get the job done, whatever it may be. Getting the job done is more important now than ever before; therefore, the fork-lift truck takes on added importance to production of goods essential to the military and to the civilian economy. In equipping workmen with fork-lift trucks, you make them much more productive while easing demands on their energies; you make them more valuable to you—and to themselves.

**CLARK ELECTRICS** (Fork Truck capacities, 1000 lbs. to 7000 lbs. Electric-Powered Hand Trucks, 6000 lb. capacity) are ideal equipment for many handling operations—in cold storage plants, food and chemical processing and similar installations. They actually do more work and at less cost, as a result of these superior features:

- ✓ automatic acceleration
- ✓ "Dead-Man" safety controls
- ✓ more dependable power
- ✓ finger-tip direction control
- ✓ faster speeds
- ✓ easy steering
- ✓ hydraulic brakes

As a step toward more power for your manpower, get well acquainted with Clark Electrics, Clark gas-powered machines and the whole Clark Leadership Line of materials handling equipment. Send the coupon and get facts of fundamental value.



**CLARK** ELECTRIC AND GAS POWERED  
FORK TRUCKS  
AND POWERED HAND TRUCKS • INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIVISION • CLARK EQUIPMENT COMPANY • BATTLE CREEK 9, MICHIGAN

Please send: ☐ Material Handling News ☐ Condensed Catalog ☐ Movie Digest

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Firm Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

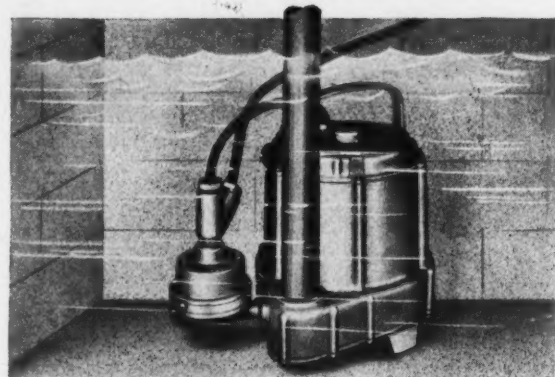
When inquiring check CP 3073 on handy form, pgs. 2-3

When inquiring check CP 3070 on handy form, pgs. 2-3

FEBRUARY, 1951

**AMAZING CAPACITY  
3300 G.P.H.**

# Kenco UTILITY PUMP



## PUMPS WATER FROM:

**BOILER PITS      DRAINAGE TRENCHES  
ELEVATOR PITS      TANK TO TANK  
UNDERGROUND PIPE INSTALLATIONS**

And from excavations and depressions or wherever water accumulates and cannot drain off. Maintenance crews use it to take care of unexpected emergencies. A Kenco Submersible Electric Utility Pump is compact, portable, automatic.

It always operates as long as there is electric current. Even if power fails pump cannot be damaged by flooding. Operation is completely automatic. The exclusive Kenco Liquid Level Switch, rated at over one hundred thousand off and on cycles, turns on the pump automatically when air pressure, created by water rising in the switch skirt, actuates the starter control. Manual switch control is obtained with a hand switch. This is used when it is desired to start pumping at any water level less than that required to start the pump automatically. There is no float to stick, warp, corrode or leak. It is almost impossible for debris or silt to foul the Liquid Level Switch. Power failure cannot harm either switch or pump. When power is restored, pump with its hermetically sealed motor instantly resumes operation, although it has remained completely submerged. Ruggedly constructed of corrosion resistant bronze. Capacity: 3300 G. P. H. at discharge head of ten feet. Order Kenco Utility Pumps from your wholesaler, or send coupon for Catalog 51.

## KENCO, INC.

1125 N. RIDGE RD.

LORAIN, OHIO

**KENCO, INC., 1125 N. RIDGE RD., LORAIN, OHIO**

Please send Catalog 51 on Kenco, Automatic, Submersible, Electric Utility Pumps.

NAME & TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

KIND OF BUSINESS \_\_\_\_\_

STREET \_\_\_\_\_

CITY & STATE \_\_\_\_\_

Dept. CP

When inquiring check CP 3074 on handy form, pgs. 2-3

Page 76

## MATERIAL HANDLING

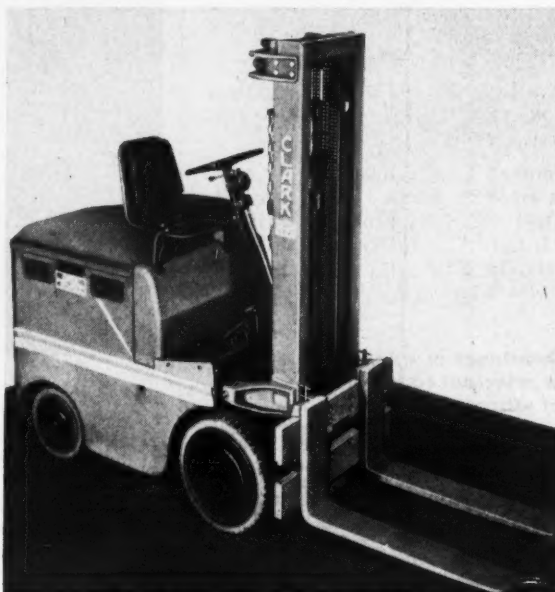
**3,000-lb capacity credited  
to latest addition to  
fork truck line . . .**

separate motor powers hydraulic pump providing the lifting and tilting movement

**Uses:** Fork truck for lifting, transporting, and positioning loads up to 3000 lb.

**Features:** Latest addition to established line of gas- and electric-powered fork trucks has separate motor to power hydraulic pump which provides lifting and tilting movement.

**Description:** Automatic acceleration offers smooth and even variations of motor speed. Acceleration is



Fork truck has capacity of 3000 lb with 24" load center

accomplished by power switch regulated by automatic timer. Driving is almost identical with that of an automobile equipped with automatic gear-shifting device. Brake sets when driver leaves his seat.

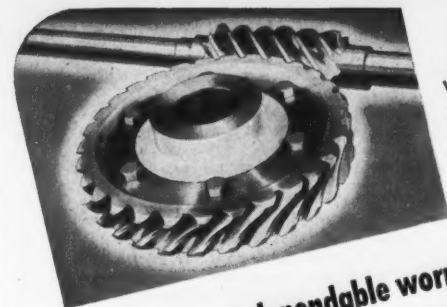
Lift heights are available in range from 84" with overall height of 61" with forks down, to 130" with overall height of 84" with forks down. Upright extensions are optional. Truck has 24" load center, and provides speeds well above user needs as determined by survey.

**Source:** Carloader fork truck is made by Clark Equipment Company, Industrial Truck Div., Dept. CP, Battle Creek, Mich. . . or for more information check CP 3075 on handy form, pages 2 and 3.

## Describes mechanical seals for rotary shafts

Mechanical seals for any kind of rotary shaft application are described and illustrated in 14-page, 3-color bulletin. Sealing is effected by contact between metal-to-carbon or metal-to-metal mating surfaces. One of these elements rotates with the shaft and the other is stationary. The stationary element does not contact the shaft.

Contents of bulletin include cutaway drawings, applications, installation data, and service records. "Mechanical Seals for Rotary Shafts" is issued by The Garlock Packing Company, Dept. CP, Palmyra, N. Y. When inquiring specify CP 3076 on handy form, pages 2 and 3.



Whether you want standard drives or special units, Cleveland can serve you.

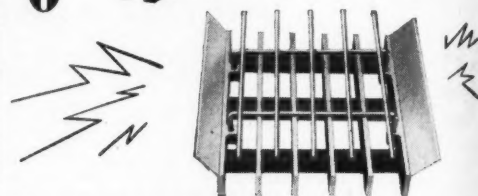
**Prompt service on dependable worm gear**

CLEVELAND offers a complete line of worm-gear sets and speed reducers, including the popular fan-cooled Speedaire, to meet the needs of any machinery or equipment builder or user. Representatives in all major industrial centers are at your service. Write for the latest Cleveland catalog, indicating your requirements. Your inquiry will receive prompt attention. The Cleveland Worm & Gear Company, 3257 East 80th Street, Cleveland 4, Ohio.

**CLEVELAND  
Worm Gear  
Drives**

When inquiring check CP 3077 on handy form, pgs. 2-3

## 6 parallel fields per foot in Bauer grate magnet



EACH channel in a Bauer Magnetic Grate is a magnetic field of high intensity. Irresistible pull is exerted upon all ferrous pieces and particles entering the magnetic fields.

Mounted above the Magnetic Grate is a wire grid which baffles the material and deflects it against the magnetized poles. This not only assists in separating the tramp iron, but also screens out sticks, straws, strings, etc.

It is a very simple task to install a Magnetic Grate in a floor opening, hopper bottom, or vertical spout. The grate is simply laid upon a frame so that it can be lifted out occasionally for cleaning.

Magnetic Grates are also used for removing iron objects, filings, and rust from liquids.

We usually build the grates to order in wanted sizes from 2" x 4" up to 6' or 8' square. Ask for Bulletin M-3-A and specific information.

**THE BAUER BROTHERS COMPANY**

1728 Sheridan Ave. • Springfield, Ohio

When inquiring check CP 3078 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## MATERIAL HANDLING

### Single hydraulic cylinder provides lifting force of fork truck . . .

forks will lift 2000 lb to their maximum elevation of 130 inches

**Uses:** Fork truck for tiering loads to 2000 lb at heights to 130".

**Features:** Lifting power is provided by single hydraulic cylinder.

**Description:** Truck height is 83"; length (including 36" forks) is 95 1/2"; width is 36". Weight is 5200 lb,



Fork truck will lift 2000 lb to height of 130"

and truck has turning radius of 60". Numerous safety features include hoist and tilt limit switches, hydraulic overload relief valve, and automatic regulation of lowering speed.

**Source:** Model 230 fork truck is made by Mercury Mfg. Co., Dept. CP, 4202 S. Halsted St., Chicago 9, Ill. . . . or for more information check CP 3079 on handy form, pages 2 and 3.

### Describes specific batteries for electric hand trucks

Series of 2-color, 8 1/2 x 11" specification sheets describes batteries for electric hand trucks. Each sheet details the battery to be used with a given make of truck. In all, 9 leading makes are represented.

Each sheet recommends battery types for light, normal, and heavy duty. Specification table designates type, capacity, dimensions, and weight for each manufacturer's truck models. Each battery is illustrated by 1 to 5 line drawings showing layout; layouts and tables indicate type of terminals, plugs, or receptacles provided. In addition, glass tape insulant, "Z" plate, and regenerative oxide are briefly discussed.

Data sheets describing batteries for specific truck models are issued by Gould-National Batteries, Inc., Dept. CP, Trenton, 7, N. J. When inquiring specify CP 3080 on handy form, pages 2 and 3.



*New*

## STAINLESS STEEL CHEMICAL CONTAINERS

*by*

**Hackney**  
MILWAUKEE

**Ideal for shipping and storing  
nitric acid, phosphoric acid, solvents  
extracts, fruit juices, oils  
and many other products**

### LOWER COSTS

Shippers of chemical products can now enjoy important savings—thanks to a new Hackney Stainless Steel Chemical Container. Compact and lightweight, this 15-gallon barrel can be handled easily by one man, reducing handling costs. What's more, further savings are possible because of the lower transportation costs, reduction in storage space and elimination of breakage.

### EASILY CARRIED

Rugged, full curled separate foot ring construction provides easy, quick and sure handling. Empty or full, Hackney Acid Barrel can be readily grasped and handled by handy ring.

### EASILY IDENTIFIED

Ownership of Hackney barrel clearly indicated by easily read letters in bottom foot ring. Prominent display of owner's name and address also serves

as a permanent advertising medium. ICC data embossed in top ring.

### POUR SAFELY

No hazards of slipping, dropping or spilling strong, dangerous acids! That's because of the safe, positive grip assured by the curled foot rings.



### STACK PERFECTLY

Hackney Acid Barrels are designed for positive stacking. Bottom foot ring fits snugly and securely over top ring of next barrel. Barrels cannot fall from this compact stack. Hackney Acid Barrels are offered in various types of stainless steel—with specific



type dependent on intended use. Write today for full details.



## PRESSED STEEL TANK COMPANY

Manufacturer of Hackney Products

1463 S. 66th St., Milwaukee 14 • 1387 Vanderbilt Concourse Bldg., New York 17  
235 Hanna Bldg., Cleveland 15 • 936 W. Peachtree St., N. W., Room 126 Atlanta 3  
208 S. LaSalle St., Room 796, Chicago 4 • 568 Roosevelt Bldg., Los Angeles 14

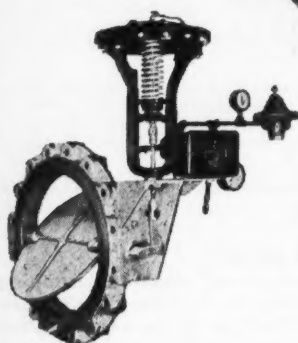
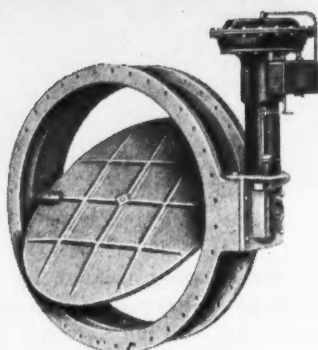
## CONTAINERS FOR GASES, LIQUIDS AND SOLIDS

When inquiring check CP 3081 on handy form, pgs. 2-3

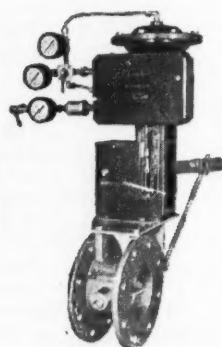
# ROCKWELL AUTOMATIC BUTTERFLY VALVES

with Air Diaphragm Motors  
for flow control and shut-off  
of air, gases, steam, liquids  
and semi-solids

42" pipe size R.P.M. cast iron butterfly valve with Bristol air diaphragm motor and valve positioner for air control in a solvent recovery system.



18" A.S.F. stainless steel wafer type butterfly valve with needle type bearings and Bristol air diaphragm motor and Foxboro positioner for temperature control on dry gas.



4" A.S.F. cast iron butterfly valve with Taylor Evenaction Lever Motor and Precisor valve positioner for regulating flow of water up to 150° F. and 5 p.s.i.

These are but a few examples. Rockwell valves are made in butterfly and slide types—with any type of manual or automatic control—in pipe sizes from 1" to 84"—for normal or heavy duty pressure or temperature. Write for Catalog.

**W. S. ROCKWELL COMPANY**  
220 Eliot St., Fairfield, Conn.

When inquiring check CP 3082 on handy form, pgs. 2-3

## Briefs . . . from contemporary publications

Here's a quick look at interesting articles appearing in other publications,  
. . . as selected by Technical Editor, Harry McCormack

### Evaporation rate of hydrocarbons and their mixtures

Ten-page paper is a study of the basic variables which affect the evaporation rate of hydrocarbon substances. Apparatus used is described and sketched. Materials used and their properties are tabulated. Curves show correlation of effect of air temperature, chemical structure of hydrocarbon, boiling point, and evaporation rate. Evaporation rates, calculated from theoretical basis, are compared with experimental rates. Rate of evaporation of hydrocarbon mixtures can be correlated on basis of A. S. T. M. distillation. Article includes 6 tables and 5 figures. ("A. S. T. M. Bulletin", Dec. 1950, page 60)

### Electrostatic collection of fly ash

Magnitude of the fly ash problem is presented and analyzed. Discusses variables in fly ash characteristics. Electrostatic precipitator design is covered with respect to electrodes, gas flow, rappers, and disposal of collected ash. Eight-page article includes 7 figures. ("Mechanical Engineering", Nov. 1950, page 873)

### Heat transfer, pressure drop in annuli

Eleven-page paper presents experimental data and results obtained when cold water flowed through one passage and hot water through an adjacent. Flow characteristics and heat transfer is covered. Data on pressure drop in the annuli are presented. Photos show flow patterns at different Reynold's numbers. Inner tubes varied from plain to finned, including 6 different types of fins. Contains 19 figures, 4 tables. ("Chemical Engineering Progress", Oct. 1950, page 490)

### Removable insulation for processing equipment

Two-page article describes system of installing insulation which has proven to be practical for use on pressure vessels subjected to severe service conditions. System allows ready access to welded joints and other critical points when inspection is required. Includes 5 figures. ("Petroleum Refiner", Oct. 1950, page 112)

### Segregation of fatty acids and their derivatives

A new method for fractionating mixtures of fatty acids on the basis of their unsaturation is accomplished by extractive crystallization with urea. Other methods available for the same purpose are commented on.

Experimental methods used are tabulated. Fatty acids tested are those of soya bean, corn oil, salmon oil, methyl esters of linseed oil, and commercially refined tall oil. Drying oil obtained from urea refined soya bean methyl

esters is compared with other drying oils with respect to physical and chemical characteristics.

Method of calculation which makes it possible to predict approximately the separation expected on mixtures of common fatty acids is presented. Article consists of 3 1/2 pages, 2 figures and 5 tables. ("Industrial and Engineering Chemistry", Dec. 1950, page 2538)

### Thermodynamic properties of propane

Based on most recent reliable data, 3-page article gives calculated thermodynamic properties of propane. Enthalpies, entropies and specific volumes at different temperatures are discussed. Pressures in the vapor, liquid, and two phase regions are presented in a temperature-enthalpy diagram, covering temperatures from 100 to 460°F and pressures from 14.7 to 10,000 psi. Includes 1 chart, 1 table. ("Petroleum Processing", Nov. 1950, page 1203)

### Ion exchange separations

Seven-page article details separations in analytical chemistry by means of ion exchange resins. Available resins are specified. Illustrated with 4 figures, 3 tables. ("Analytical Chemistry", Nov. 1950, page 1352)

### Revamped contact process for sulfuric acid

Six-page article describes a contact process for sulfuric acid in which many of the customary methods used for production and absorption of sulfur trioxide have been discarded. Affords a smaller plant which is easier to operate. Shows savings in fuel and water. All construction is out of doors, except for control room. Includes 9 photos, 2 flow sheets, 1 figure. ("Chemical Engineering", Oct. 1950, page 103)

### Estimation of reducing sugars in starch hydrolyzates

Eight-page article describes a method for quantitative determination of glucose, maltose and reducing dextrine in starch hydrolyzates. Portable error is 2%. Equipment and techniques are described. Method is applied to samples of known value and results are tabulated. Includes 4 figures, 1 table. ("Canadian Journal of Research", Sec. B, Sept. 1950, page 527)

### Resin bonding of hardwood fibers in offset papers

Experimental results with short hardwood fibers are reported on in 10-page article. Methods used in preparing papers from pulps, prepared by The Forest Products Laboratory, are given. Sampling and testing methods are told.

CHEMICAL PROCESSING

Physical properties of experimental papers are compared with certain commercial papers. Results are presented graphically. Includes 13 figures, 3 tables. ("Journal of Research NBS", Sept. 1950, page 208)

#### Heat transfer data for kettles with jackets and coils

Experimental study of heat transfer is contained in an 11-page report. Equipment used is described and illustrated. Data are tabulated for six liquids with widely varying physical and thermal properties. Liquid was agitated in some cases.

Two equations, derived from correlated data, are proposed as applicable to design calculations. Includes 10 figures, 8 tables. ("Industrial and Engineering Chemistry", Nov. 1950, page 2303)

#### Plastic sheet as a glazing material

Use of plastic sheet to replace corrugated sheet iron is described in 2-page article. Installation techniques are related. Advantages in use of plastic sheets are enumerated. Includes 5 figures. ("Plant Engineering", Nov. 1950, page 61)

#### Selective esterification of tall oil

Technique used and results obtained in an esterification process for separating fatty acids from rosin acids are discussed in a 6-page article. Includes 7 figures and 7 tables. ("Journal of American Oil Chemists' Society", Oct. 1950, page 361)

#### Joints for piping

Various methods used for joining pipe, other than threaded joints, are discussed in 2½-page article. Required techniques for brazing, soft soldering, lead welding and joining dissimilar metals are commented on. Illustrated with 3 figures. ("Heating, Piping and Air Conditioning", Oct. 1950, page 75)

#### Agricultural diluents

Function of various diluents used in agricultural spray materials is discussed in 3-page article. Lists factors in effectiveness of each. ("Agricultural Chemicals", Nov. 1950, page 43)

#### Plasticizers from lactic acid

Article investigates the properties of 35 esters of lactic acid when used as plasticizers with cellulose acetate and polyvinyl chloride. Results are tabulated. ("Industrial and Engineering Chemistry", Nov. 1950, page 2374)

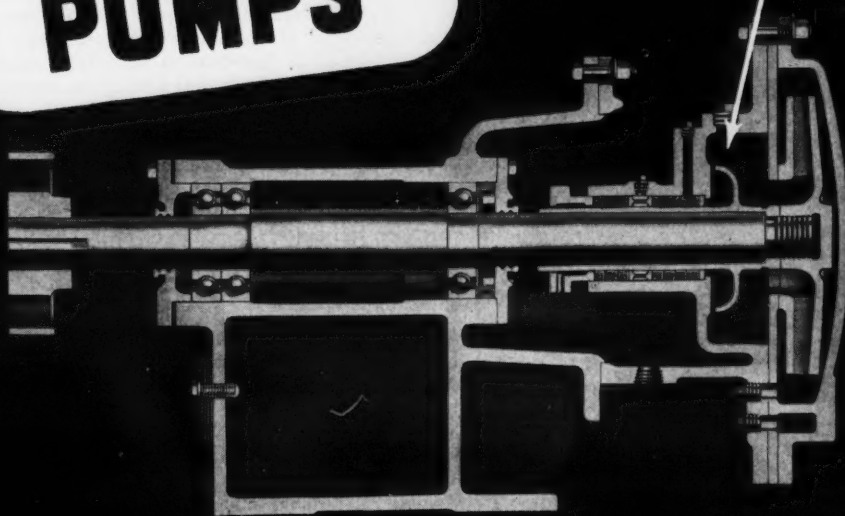
#### Catalytic reactions at high temps, pressures

Design and construction of a continuous, small-scale plant for studying catalytic reactions at elevated pressures and temperatures is the objective of this 7-page article. Apparatus is described and illustrated by schematic drawings, photos. Operations in the decomposition of butanol-1 are described and results tabulated. Includes 4 figures, 3 tables. ("Chemical Engineering Progress", Nov. 1950, page 556)

FEBRUARY, 1951

## ALLIS-CHALMERS PROCESS PUMPS

THIS IS THE EQUISEAL STUFFING BOX with an auxiliary rotor that develops a low pressure area directly in front of the packing. On suction heads up to fifteen feet the pressure on the packing is zero.



# NEW EQUISEAL STUFFING BOX Stops Leakage

**I**F YOU MUST STOP PUMP LEAKAGE because of sanitation, corrosion or for any other reason, you can stop *all* leakage for suction heads up to fifteen feet by using the Allis-Chalmers Process Pump with the *Equiseal* stuffing box.

With this pump, maximum pressure on the packing is limited to suction conditions. When suction head is negative, leakage is no problem. When suction head is positive, however, packing pressure requires extra control to prevent leakage. This extra control is the *Equiseal* stuffing box with an auxiliary rotor that develops a low pressure area directly in front of the stuff-

ing box. Pressure on the packing is zero for suction heads up to fifteen feet.

The *Equiseal* stuffing box is so effective that the packing can be removed while the pump is operating on positive suction head and there will be no leakage even though there is a direct passage from pump suction to atmosphere. The *Equiseal* stuffing box can be added to your present Allis-Chalmers Process Pumps.

If you pump corrosives or abrasives, you should know about the *Equiseal* stuffing box. Ask your Allis-Chalmers Sales Office or write Allis-Chalmers, Milwaukee 1, Wisconsin for Bulletin 08B6615. A-3247

*Equiseal*, *Texrope* and *Vari-Pitch* are Allis-Chalmers trademarks.

# ALLIS-CHALMERS

When inquiring check CP 3083 on handy form, pgs. 2-3

Sold . . .

Applied . . .

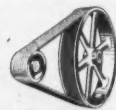
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.



**MOTORS** — ½ to 25,000 hp and up. All types.

**CONTROL** — Manual, magnetic and combination starters; push button stations and components for complete control systems.

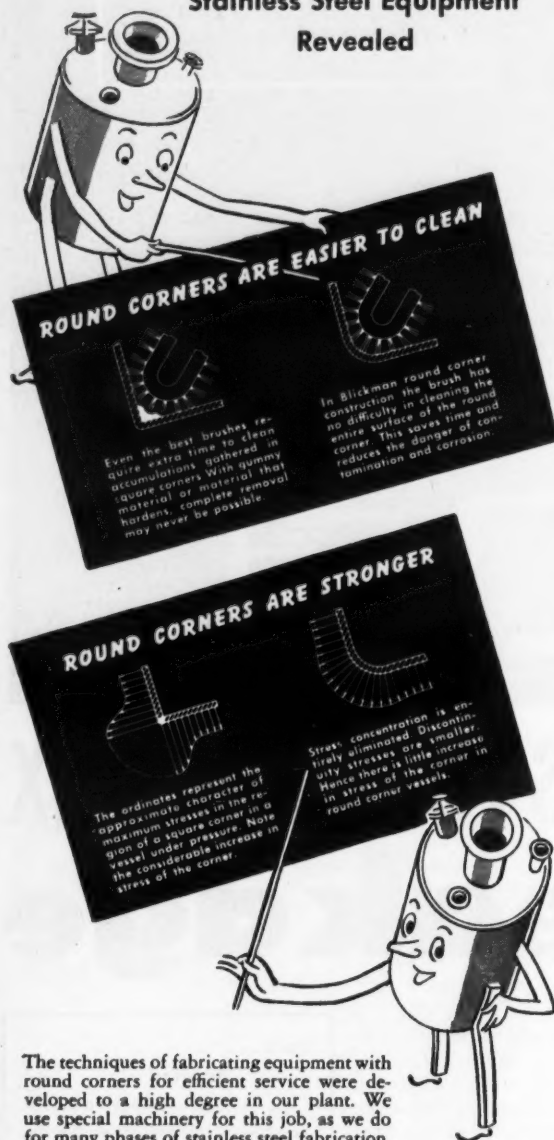


**TEXROPE** — Belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.



## WHY THEY BUILT ME WITH ROUND CORNERS

Advantages For Your  
Stainless Steel Equipment  
Revealed



The techniques of fabricating equipment with round corners for efficient service were developed to a high degree in our plant. We use special machinery for this job, as we do for many phases of stainless steel fabrication.

FOR BETTER STAINLESS STEEL EQUIPMENT,  
CONSULT WITH US.

S. BLICKMAN, INC., 702 GREGORY AVE., WEHAWKEN, N.J.

**S. BLICKMAN, INC.**  
Guards Alloys in Fabrication

SEND FOR THIS VALUABLE BOOK  
A request on your letterhead will bring our guide, "What to Look For When You Specify Stainless Steel for Your Processing Equipment."

CORROSION-RESISTANT PROCESSING EQUIPMENT

TANKS • KETTLES • STILLS • HEAT EXCHANGERS • AGITATORS • MIXERS • TOWERS • PIPING

When inquiring check CP 3084 on handy form, pgs. 2-3

## New Literature

### Reference book presents facts about the aluminum family

In view of the fact that aluminum is no longer as much a single metal as a large family of metals, each with its own peculiar properties, 194-page reference book is designed to meet the demand for more factual information on aluminum alloys and mill products. To make an intelligent selection of aluminum types, the user must have just such definite information on alloys, tempers, sizes, shapes, chemical and physical properties, mechanical properties, and fabricating characteristics.

These vital facts are all condensed into a pocket-sized manual which contains 117 tables of data on properties, tolerances, weights, sizes and production limits, and general fabrication. Included are tables showing relative corrosion resistance, the action of many chemicals on aluminum, elevated and low-temperature properties, minimum bend radii, joining methods, finishes, and similar considerations.

In addition, 33 pages of explanatory text cover a wide range of related subjects such as the alloy designation system, the temper designation system, heat-treatable and non-heat-treatable alloys, casting alloys, casting methods, and foundry practice. Wrought aluminum mill products are detailed, and manufacturing methods described. Fabricating methods for the wrought alloys are discussed, including blanking and forming operations, machining, forging, joining, and surface finishing.

Another section covers pig and ingot products, while separate sections define the terms used and stress special characteristics of aluminum. Condensed table of contents on title page indicates where to look for specific information. Tables are listed in a special table of contents. All tables are arranged in groups for ready reference.

In addition, back of the book carries a complete detailed cross index, covering both tabular and text material. Wire-bound to permit flat opening, the 6 x 9" book also contains 61 illustrations showing various operations in the production of aluminum. "The Aluminum Data Book" is issued on letterhead request to Reynolds Metals Company, Dept. CP, 2500 S. Third St., Louisville 1, Ky.

### Magnetic impurities removed from process pipelines

Two-page, 2-color bulletin describes a magnetic pipeline trap used to remove tramp iron from pipelines carrying liquids and semi-liquids. Trap is pressure tight, constructed of Alnico V metal, and available in sizes from 2 to 4". Permanent magnet requires no power feed. Complete description, specifications, and various advantages are listed in Bulletin 202, issued by Erie Manufacturing Company, Dept. CP, Erie, Pa. When inquiring specify CP 3085 on handy form, pages 2 and 3.

### Solids in boiler water quickly determined

Quick and simple method for determining solids content of boiler water or condensate is described and illustrated in 6-page bulletin. Test procedure utilizes conductivity meter in conjunction with cell, dial thermometer, conductivity cylinder, and reagent. Samples may be tested

at any convenient temperature, as meter has a temperature compensator.

Equipment permits almost instant determination of proper dial setting. Reading is in micromhos, and may be used directly or translated to ppm through use of suitable factor. Further details are contained in Bulletin 2RE50, issued by Hall Laboratories, Inc., Dept. CP, Hagan Bldg., Pittsburgh 30, Pa. When inquiring specify CP 3086 on handy form, pages 2 and 3.

### Drier cake is goal of disc filter

Disc filter described in 8-page bulletin is designed to produce a dry cake, thus recovering all liquid. It is used by metallurgical, chemical, coal, cement, paper, water treatment, and similar industries. Tank can be divided into various sections so that more than one product can be filtered simultaneously; double outlet valves permit segregation of strong and weak filtrates, especially where washing cycle is desired.

Many photographs and explanatory drawings are included in Bulletin F9-B2, issued by Denver Equipment Co., Dept. CP, 1400 Seventeenth St., Denver 17, Colo. When inquiring specify CP 3087 on handy form, pages 2 and 3.

### Packings and piston rings for industrial service

Forty-page catalog covers packings and piston rings for industrial service. Featured are chrome-plated and Teflon piston rings. Packings and piston rings catalog is issued by Dept. S, France Packing Co., Dept. CP, 6510 Tacony St., Philadelphia 35, Pa. When inquiring specify CP 3088 on handy form, pages 2 and 3.

### Applications for speed reducers and worm gear drives

Eight-page leaflet stresses the uses to which maker's worm gear drives and speed reducers may be put. Illustrations, accompanied with descriptive text, point-up actual installations in the fields of plastics, mining, paper, steel, and others.

Leaflet's back cover pictures various types of drives that are available, including recent types with vertical take-off shaft. "Dependable Through 38 Years" is issued by The Cleveland Worm and Gear Company, Dept. CP, 3293 East 80th Street, Cleveland 4, O. When inquiring specify CP 3089 on handy form, pages 2 and 3.

### Reference book details costs of process equipment

Costs of chemical engineering equipment are estimated in 419-page, 6 x 9" book, authored by a series of experts in each phase of equipment discussed. Book contains 354 illustrations, 200 costs charts, and 106 tables, is logically arranged and indexed. Intention of book is to provide easy access to information about cost estimation and equipment selection.

Individual chapters cover factors involved in chemical

engineering costs, and methods for estimating them; types of heat exchangers, their construction, operation, and price; selection of evaporators, including cost curves for vertical, horizontal, long-tube, and forced-circulation types; costs of various direct and indirect heat dryers, and heat requirements for drying; discussion of spray dryers; equipment and operating costs for mechanical and vacuum crystallizers; treatment of tower design and numerous tables and charts about bubble-tray and packed towers.

Other chapters cover plate and frame filter presses; vacuum filters; centrifuges; crushing and grinding equipment; dust collecting equipment; fans and blowers; centrifugal pumps; reciprocating compressors; steam-jet ejectors; rotameters; water conditioning; steam generation; and industrial materials, including 110 cost charts and 42 cost tables for pipe, fittings, valves, tubing, sheet metal, and numerous other items.

Scope even extends to industrial buildings, and all data is up-to-date. To obtain "Chemical Engineering Costs", remit \$7 direct to Industrial Research Service, Dept. CP, Masonic Bldg., Dover, N. H. When inquiring specify CP 3090 on handy form, pages 2 and 3.

#### Case histories presented indicate 50-year corrosion protection

Four-page publication cites case histories that show how metallizing with zinc gives corrosion protection. Indications are that system will afford up to 50 years' protection under normal circumstances. "Metco News", Vol. 5, No. 5, is issued by Metallizing Engineering Co., Inc., Dept. CP, 38-14 Thirtieth St., Long Island City 1, N. Y. When inquiring specify CP 3091 on handy form, pages 2 and 3.

#### Overload protection device built into coupling

Two sizes of cut-out couplings are described in 12-page catalog. Working ranges are from 10 to 2,000 inch-pounds torque. Units are totally enclosed, operate at speeds to 2400 rpm, and combine overload protection with the features of a flexible coupling. Catalog 50A is issued by Anchor Steel and Conveyor Company, Dept. CP, 6906 Kingsley Ave., Dearborn, Mich. When inquiring specify CP 3092 on handy form, pages 2 and 3.

#### Details fluorescent lights

Three-color bulletin contains much information about fluorescent lighting fixtures with lamps measuring 48, 72, and 96" long. Details are given for individual units, continuous line systems, and such accessories as sliding hanger suspension fittings. Wide variety of styles are presented in well-illustrated AIA File 31-F-23, issued by Benjamin Electric Mfg. Company, Dept. CP, Des Plaines, Ill. When inquiring specify CP 3093 on handy form, pages 2 and 3.

#### Ease of modification featured in operating valve series

Series of hand and foot operating valves presented in 4-page bulletin features interchangeability of parts and ease of modification. Valves are for quick control of small cylinders and for pilot operation of master valves. Sizes are  $\frac{1}{4}$  and  $\frac{3}{8}$ ", available in 3-way and 4-way types. Further information, such as installation data and engineering drawings, is contained in Bulletin 303, issued by Ross Operating Valve Company, Dept. CP, 120 E. Golden Gate Ave., Detroit 3, Mich. When inquiring specify CP 3094 on handy form, pages 2 and 3.

#### BURRELL COMBUSTRON MODEL 110

*Leaders in the Furnace Field-*

**BURRELL**

*presents*

**COMBUSTRON**

THE MODERN HIGH FREQUENCY INDUCTION HEATER

**Designed with the cooperative efforts of leading steel chemists for steel chemists**

The Burrell Combustron is a high frequency heater for carbon-by-combustion analysis in steel.

Designed with the cooperative efforts of leading steel chemists, Burrell Corporation has developed a highly efficient and economical unit to meet the increasing demands for rapid and accurate carbon determinations in the steel industry.

Attractively designed, the Burrell Combustron is a compact bench model heater, saving space and eliminating excessive heat in the laboratory.

Ready for operation instantly—No preheat time required.

The Burrell Combustron will accommodate all types of steel samples, ranging from coarse to fine meshes and low to high carbon content, including alloy steel, cast iron, and stainless steel.

Greater savings in operating cost through elimination of conventional combustion tube—No heating elements to replace.

Incorporates the use of transparent horizontal tube and standard boats—No extra accessories needed.

Available for either 115 volts or 230 volts, 60 cycle, 1 phase.

"Ask for Bulletin 319 for further information"

**BURRELL CORPORATION 1942 FIFTH AVE., PITTSBURGH 19, PA.**

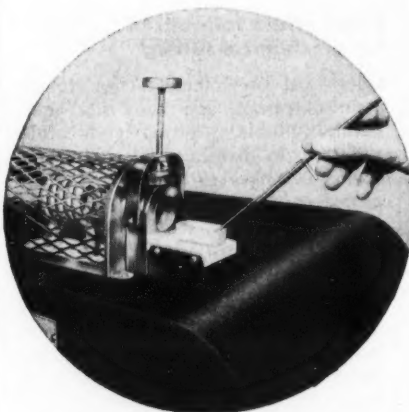


Illustration of conventional horizontal work coil and combustion tube assembly



When inquiring check CP 3095 on handy form, pgs. 2-3

# OMEGA

the mighty midget!



Small size, big capacity — you get both features in this new dry material feeder. Ruggedly built, the Omega Midget Belt Gravimetric is small enough to fit on your desk top — yet its capacity is big enough for heavy feeding loads. Never before have so many feeder-features been packed into so small a space:

- **Stainless-steel construction**
- **Non-flooding feeding mechanism**
- **Dust-proof feeding**
- **Unusual capacity — from cubic inches to 3 cubic feet per minute**
- **One-piece conveyor belt**
- **Simple mechanical feeding control**
- **Operates with 1/4 HP motor**
- **Compact — needs only 6 sq. ft. space**

For detailed information, including dimension drawings and engineering data, send for new Bulletin 35-G5. Omega Machine Co. (Division of Builders Iron Foundry), 387 Harris Ave., Providence 1, R. I.

OMEGA manufactures a complete line of volumetric and gravimetric feeders for dry materials and for gravity feeding of liquids and solutions:

Belt-Type Gravimetric Feeders • Loss-in-Weight Gravimetric Feeders • Universal Feeders • Precision Solution Feeders • Disc Feeders • Rotadip Solution Feeders • Rotolock Feeders • Dust Collectors • Bucket Elevators



When inquiring check CP 3096 on handy form, pgs. 2-3

## NEW LITERATURE

### How to make sales to the Army

Opening statement, "It is not necessary to employ agents, counsellors, advisors, or any agency on a commercial basis in order to obtain government business," characterizes the helpful nature of 32-page bulletin that tells how to sell to the U.S. Army.

Contents include information on where purchasing is accomplished; how procurement is accomplished, including formal advertising and negotiations; contracts, including such types as cost-plus-percentage-of-cost, fixed price, cost, cost-plus-fixed-fee, time-and-materials, letter-of-intent, and letter contracts.

Miscellaneous section includes information about mistakes in bids, subcontracting, specifications, inspection, delivery schedules, payment, and conclusions. Two appendices list purchased items and purchasing locations of Dept. of the Army, and local purchases. Convenient index showing location of military purchasing offices is also included.

To obtain "How to Sell to the United States Army", remit 30c direct to the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

### Sheet offers tolerances for mechanical tubing

Data card on tolerances for round seamless carbon and alloy steel mechanical tubing gives permissible variations in diameter and wall thickness. It refers to cold-drawn-unannealed and finished-annealed tubing in sizes to 8-7/8" OD, and to hot-finished tubing in sizes to 9-5/8" OD.

Information is presented in tabular form. Data Card 115C is issued by The Babcock & Wilcox Tube Company, Dept. CP, Beaver Falls, Pa. When inquiring specify CP 3097 on handy form, pages 2 and 3.

### Indicators, recorders, controllers

Comprising 8 pages in all, combined bulletin and price list presents typical selection of controllers, indicators, and recorders. Items are illustrated and briefly described.

Bulletin Z 6600 is issued by Wheelco Instruments Company, Dept. CP, 847 W. Harrison St., Chicago 7, Ill. When inquiring specify CP 3098 on handy form, pages 2 and 3.

ABBÉ ENGINEERING

# Milling

That's Interesting!

Break It Up!

Illustration of large notations in an opened up position of the Abbe Teller. In the place of a well known material of great value.

Ask Us to Send This House Organ REGULARLY...

It'll give you new ideas many times a year on better grinding, milling, mixing and sifting methods you can use in your work.

Just send your name, title, company and plant address.

ABBÉ ENGINEERING CO.  
46 CHURCH STREET • NEW YORK 7, N. Y.

When inquiring check CP 3099 on handy form, pgs. 2-3

**OLD METHOD**  
Ordinary Truck

**NEW METHOD**  
Sabin Truck

**NO HELPERS--**

## SABIN

One-Man

## BARREL TRUCK

**Other Sabin Trucks:**  
KEG, BOX, CARBOY,  
WIRE COIL, TOTE  
PAN, etc. Write for  
Bulletin No. 48.

Picking up barrel and drum loads weighing as much as 800 pounds is now an easy job for One Man with a Sabin Type "L-3" Barrel Truck.

Operation is very simple. You run truck up to container, hook on at top, then pull back on handle to pick up load.

THIRD WHEEL FEATURE insures better balance and added safety in moving loads.

WRITE FOR BULLETIN NO. 48-A

**THE SABIN MACHINE CO.**  
6534 Carnegie Avenue  
Cleveland 3, Ohio

When inquiring check CP 3100 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## A MAGNETIC SEPARATOR with PROVEN PERFORMANCE!



## the FRANTZ FERRO FILTER

Proven through demonstrated effectiveness in some of the best known plants in the country by separating any form of foreign substance subject to magnetic attraction.

The FerroFilter in any one of three types: gravity, underfeed or pipeline, cleans up the liquid—prevents product rejections or lowering of grade.

Catches iron particles sometimes as fine as one micron.

Available also in dry type with vibrator for granular materials and powders.

Dept. CP

**S. G. FRANTZ CO., INC.**

P.O. Box 1138 Trenton 6, New Jersey

When inquiring check CP 3101 on handy form, pgs. 2-3

In plants which actually manufacture the acids and alkalis you use, Prufcoat has been providing positive protection against costly corrosion for over 10 years now . . . on concrete floors, walls, ceilings, structural steel, tanks and other equipment. Write for Prufcoat literature.

## Where Acids or Alkalies Destroy Prufcoat PROTECTS



**NEW! PRUFCOAT METAL-REACTIVE PRIMER P-10**

Does not require as complete surface cleaning as most other priming methods and works well on damp or dry surfaces. Write today for Prufcoat Technical Bulletin 012.

Prufcoat Laboratories, Inc.  
50 East 42nd Street  
New York 17, N.Y.

**Preventive Maintenance PAYS!**

When inquiring check CP 3102 on handy form, pgs. 2-3

FEBRUARY, 1951

## NEW LITERATURE

### Comprehensive catalog shows over 30 types of dryers

More than 30 types of dryers are presented in 2-color, 12-page comprehensive catalog that points out which types are most suitable for specific materials. Continuous and batch dryers, rotary kilns, coolers, and calciners are described and illustrated. Special sections are devoted to a pilot dryer and to engineering and production facilities offered by company.

Catalog 508 is issued by Standard-Hersey Dryer Division, Standard Steel Corporation, Dept. CP, 5001 Boyle Ave., Los Angeles 58, Calif. When inquiring specify CP 3103 on handy form, pages 2 and 3.

### Shows steam specialties

Thirty-three-page catalog contains full descriptions and specifications for line of steam specialties. Units include steam and air traps, pressure reducing valves, pump governors, pressure and temperature regulators, and boiler feed controls.

Steam specialties catalog is issued by The C. E. Squires Company, Dept. CP, 18502 Syracuse Ave., Cleveland 10, O. When inquiring specify CP 3104 on handy form, pages 2 and 3.

### Details regulating valves, desuperheaters, pilots

Four-page, 2-color folder gives useful information on temperature regulators, pressure regulators, and desuperheaters. Complete explanation of principles of pilot-operated regulating valves is given, in addition to data and illustrations of 27 pilots.

Pilot folder is issued by Spence Engineering Company, Inc., Dept. CP, Walden, N. Y. When inquiring specify CP 3105 on handy form, pages 2 and 3.

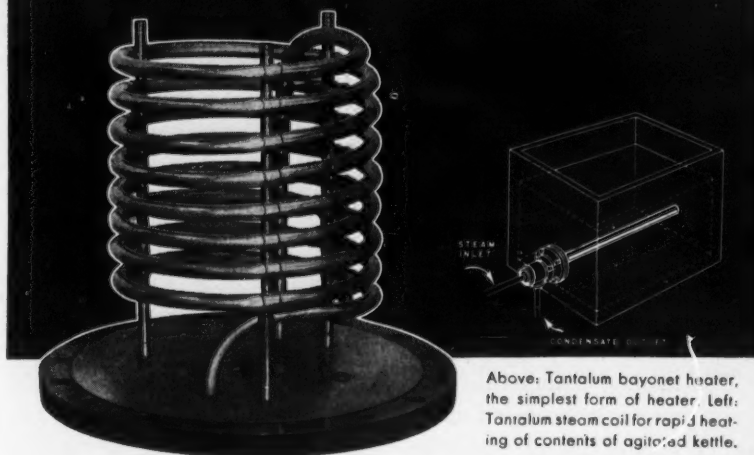
### Lightweight pipe has many uses

Four-page bulletin illustrates typical applications for lightweight pipe in the construction, material handling, mining, and power plant fields. Data is included on fittings, flanges, connections, and specifications for pipe from 4 to 30" in diameter.

Bulletin 507 is issued by Naylor Pipe Company, Dept. CP, 1230 E. 92nd St., Chicago 19, Ill. When inquiring specify CP 3106 on handy form, pages 2 and 3.

## It can cost so little....

## TANTALUM Heat Transfer Equipment



Above: Tantalum bayonet heater, the simplest form of heater. Left: Tantalum steam coil for rapid heating of contents of agitated kettle.

## .....to have the best!

Case history after case history testify to the fact that Tantalum heat exchangers not only effect savings which pay for the equipment in very short periods of time but, in the long run, give economies in maintenance which appear as big black profit figures.

How is all this made possible? By the very nature of the metal from which the heaters are made . . . tantalum. Tantalum combines the physical properties of steel with the chemical properties of glass, giving it three important qualities. 1. Speed in heat transfer. 2. Acid proof—for most acid solutions and corrosive gases or vapors. 3. Freedom from thermal shock. The results . . . the heaters heat faster, saving time, fuel and space—have a long life expectancy—give freedom from product contamination due to corroded equipment. Single bayonet-type Fansteel Tantalum Heaters are standard. Multiple bayonet and shell and tube type heat exchangers are designed and built to specifications.

**USE TANTALUM WITH ECONOMY** for most acid solutions, corrosive gases or vapors; not with HF, alkalis or substances containing free SO<sub>3</sub>.

Write for informative bulletins on Tantalum Acid-Proof Chemical Plant Equipment.

Fansteel engineers are at your service for consultation on any corrosion or heat transfer problem where the metal tantalum can be economically used to your best advantage. Fansteel Metallurgical Corporation, North Chicago, Illinois, U.S.A.



AN INDUSTRY THAT SERVES INDUSTRIES

## Fansteel

Acid Proof

**TANTALUM**  
CHEMICAL PLANT EQUIPMENT

12401-C

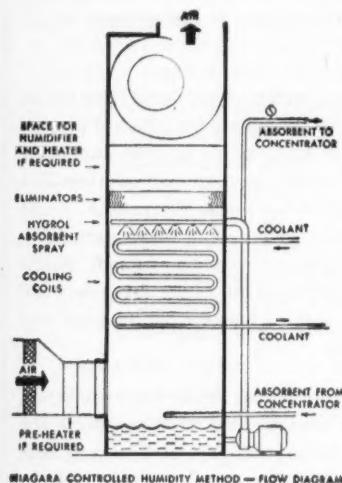
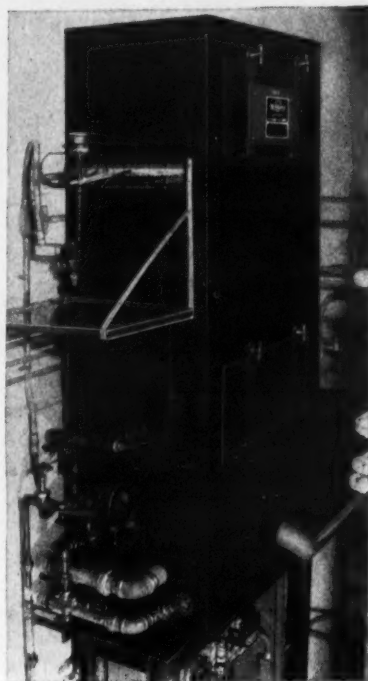
When inquiring check CP 3107 on handy form, pgs. 2-3

# New "Controlled Humidity" Method Gives a Better Solution to Air Conditioning Problems

**"Hygrol" Absorbent Liquid  
Dehumidifies Fresh Air  
Without Refrigeration**

NIAGARA Air Conditioners or Dehumidifiers using "Hygrol" liquid absorbent give precise control of air temperature and humidity... at lower operating cost, with large savings in space and with smaller and less expensive equipment, in many applications.

This method dehumidifies the air by passing it through a chamber in which "Hygrol" spray removes its moisture and produces a low dew point. The "Hygrol" solution resulting is continuously and automatically re-concentrated, providing always full capacity in



Write for Bulletin 112

## NIAGARA BLOWER COMPANY

Over 35 Years Service in Industrial Air Engineering

Dept. CP, 405 Lexington Ave.

New York 17, N. Y.

Experienced District Engineers in all Principal Cities

When inquiring check CP 3108 on handy form, pgs. 2-3

## NEW LITERATURE

### Hydraulic control valves fill 22-page catalog

Twenty-two-page catalog section presents numerous hydraulic control valves. All valves are illustrated by photographs and cutaway drawings, described, and specified.

Partial list of contents includes: construction of valves; 2-position valves; 3-position, 4-way valves; manually operated valves; pilot-operated 4-way valves; cam-operated valves (2-position, 2, 3, and 4-way); foot-operated 4-way valves (2-position, free or latching control); electric solenoid-operated valves; pilot-operated 1/8" port valves; (4-way, 2 and 3-position); high pressure oil valves; water service valves; special valves; and accessory valves.

Also included are typical circuit diagrams showing suggested methods of using these valves; information on fluid transfer capacities of 1/4 to 2" port valves; and various items of allied equipment.

Data are all up-to-date. Catalog 200, Section 4, is issued by Logansport Machine Co., Inc., Dept. CP, Logansport, Ind. When inquiring specify CP 3109 on handy form, pages 2 and 3.

### Welds on cast iron have same color

Several case histories and physical properties are presented in data sheet describing welding rod for making welds on cast iron by means of oxy-acetylene torch.

Alloy is applied at 1000°F below melting point of base material; completed weld has tensile strength of 50,000 psi. Fully machinable alloy matches color of base material.

Data sheet on EutecRod 14FC is issued by Eutectic Welding Alloys Corporation, Dept. CP, 40 Worth St., New York 13, N.Y. When inquiring check CP 3110 on handy form, pages 2 and 3.

### Data on moisture coatings and insulating enamel

Series of technical bulletins gives data on enamel and coatings. Technical Bulletin 101 specifies electrical insulating enamel; Technical Bulletins 102 through 112 specify moisture- and fungus-resistant coatings.

All are issued by Lacquer & Chemical Corporation, Dept. CP, 214 Fortieth St., Brooklyn 32, N.Y. When inquiring specify CP 3111 on handy form, pages 2 and 3.

## More Effective Washing



with Infinitely Variable Speed  
**TOLHURST CENTRIFUGALS**

Tolhurst Hydraulic Drive Center-Slung Centrifugals with stepless variable speeds enable you to select the correct speed for most effective washing of your particular product. Tachometer indicates exact basket speed at all times.

Baskets can be perforate or imperforate, constructed of steel, steel rubber covered, stainless steel, monel or other alloys. Steel case can be lined with stainless steel, monel, rubber or other materials as specified. Fume-tight cover can be furnished complete with feed and spray pipe.

Write for Details and Prices

**TOLHURST CENTRIFUGALS  
DIVISION**

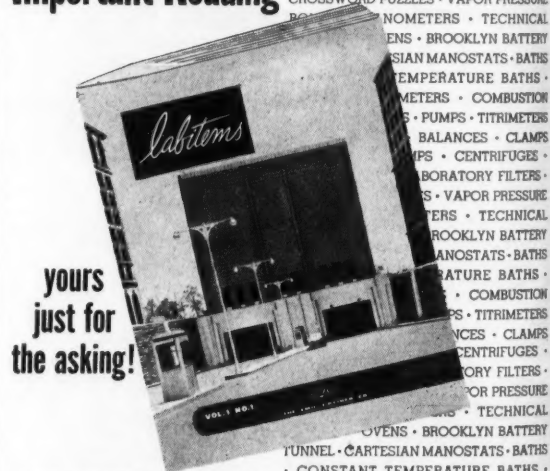
### BASKET SIZES AND SPEEDS:

12" dia.	0-3400 RPM
20" dia.	0-1400 RPM
24" dia.	0-1400 RPM
26" dia.	0-1200 RPM
30" dia.	0-1000 RPM
40" dia.	0-850 RPM
48" dia.	0-750 RPM

AMERICAN MACHINE  
AND METALS, INC.  
East Moline, Illinois

When inquiring check CP 3112 on handy form, pgs. 2-3

## Important Reading



yours  
just for  
the asking!

Our own publication... just off the presses! 32 pages jam-packed with news and photographs of more than 50 new products, and articles of technical and general interest. We'd like you to have a copy: we think you'll find it interesting reading.

**The EMIL GREINER Co.**

SEND FOR IT NOW!

THE EMIL GREINER COMPANY  
20-26 North Moore Street, New York 13, N. Y.  
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City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_  
Attention of: Name \_\_\_\_\_ Title \_\_\_\_\_

When inquiring check CP 3113 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Catalog presents full line of chains and sprockets**

Complete line of chains and sprockets for drives, conveyors, and elevating equipment is presented in catalog. Twenty-two types of steel and alloy chains as well as many units designed for special requirements are shown and described in detail. Catalog A418 is issued by The Jeffrey Manufacturing Company, Dept. CP, 956 N. 4th St., Columbus, O. When inquiring specify CP 3114 on handy form, pages 2 and 3.

**Filler-conveyor system for dry products**

Advantages and operational details of an automatic filler and conveyor system are completely described in illustrated bulletin. Contents tell how positive fill of any dry product in a variety of sizes and shapes of flat bottom containers can be obtained without spillage; shows the versatility of this system in production speed and use; and points out the ease of conversion for different products and containers. "Whiz-Packer" is issued by Frazier & Son, Dept. CP, 338 Cortlandt St., Belleville 9, N. J. When inquiring specify CP 3115 on handy form, pages 2 and 3.

**Capacities from 30-1000 gph credited to demineralizers**

Series of catalog sheets contains information about ion exchange systems ranging in capacity from 30 to 1000 gph. Systems are used for purifying raw water. Each sheet features photograph of equipment, working diagram, description of parts, specifications chart, and performance chart. "Water Demineralizers" is issued by Penfield Manufacturing Company, Inc., Dept. CP, 19 High School Ave., Meriden, Conn. When inquiring specify CP 3116 on handy form, pages 2 and 3.

**Bulletin shows applications, features of air motors**

Three-color, profusely illustrated bulletin contains 24 pages showing diverse applications of air motors. Bulletin not only gives complete specifications for line of air motors, but also suggests many different uses that have been found for them. Installation photographs as well as cost-and-production data are included.

Among the applications cited are: light broaching jobs; tube flaring; punching operations; feeding wood through planers and saws; trimming flash; operating paint sprayers; glue clamping; threading wooden spindles; staking operations; loading and unloading conveyors; setting dowel pins; opening and closing permanent molds; crimping grommets; operating power turret slides; moving test tanks; working cutter knives; and operating collets.

Numerous other applications are also given. Feature illustration is a 2-page, colored drawing of the standard air motor, with important points indicated. Such lesser equipment as remote control valves, manual valves, checking accessory, incoming air pressure control, air presses, air vises, rotary feeds, timing units, and similar items are also described and illustrated.

Information on company's air power consultation service is also contained in Bulletin CL-30, issued by The Bellows Company, Dept. CP, 222 W. Market St., Akron, Ohio. When inquiring specify CP 3117 on handy form, pages 2 and 3.



## FOR FLEXIBILITY IN FLUID TRANSMISSION

It's worth checking into — one of the many Tygon Plastic formulations may be the answer to your tough corrosion problems.



Where flexibility, clearness, and freedom from toxicity is a must in fluid transmission — there's only one answer, TYGON plastic TUBING.

Tygon Tubing is tough as leather, flexible as a piece of string, clear as glass. It neither imparts nor absorbs taste or odor. Resistant to acids, alkalies, oils, water, alcohols. Mirror-smooth surface inside and out speeds flow; makes cleaning easy. Tygon Tubing can be steam sterilized.

Tygon Tubing is made in bores in standard or special sizes up to 2" ID, and is available with an outer braid-reinforcement for pressure applications.

Bulletin T-77 contains complete technical information. Free on request. Write for it today. Address The U. S. Stoneware Co., Tallmadge Square, Akron 9, Ohio.

MANUFACTURERS AND FABRICATORS OF CORROSION RESISTANT MATERIALS AND EQUIPMENT SINCE 1865

When inquiring check CP 3118 on handy form, pgs. 2-3

## NEW LITERATURE

### Profiles significant features of water treatment system

Four-page, 2-color bulletin describes water treatment system as it applies to self-contained boilers. Same type of treatment can also be extended to protect pumps, heaters, traps, and valves from scale and corrosion. System mainly consists of adding a chemical to the water. Bulletin 49 is issued by National Aluminate Corporation, Dept. CP, 6216 W. 66th Place, Chicago 38, Ill. When inquiring specify CP 3119 on handy form, pages 2 and 3.

### Temperature and humidity controlled in cabinets

Four-page bulletin illustrates and describes cabinets providing temperature control for research and testing. One series has operating range from -50 to 180°F; other series has range from -80 to 180°F. Both series can be equipped with apparatus providing humidity conditions from 20 to 95% between 35 and 180°F. Bulletin S-950 is issued by Bowser Inc., Refrigeration Div., Dept. CP, Terryville, Conn. When inquiring specify CP 3120 on handy form, pages 2 and 3.

### No ventilation needed by induction motors

Totally enclosed induction motors described and illustrated in 4-page bulletin have no ventilation, are suited for service in locations where dirt, dust, lint, metal turnings, and sand are prevalent. Motors meet NEMA and AIEE standards. At present, 7½ hp, 1800 rpm and 5 hp, 1200 rpm motors are in production. Further details are contained in Bulletin 1215, issued by Fairbanks, Morse & Co., Dept. CP, 600 S. Michigan Ave., Chicago 5, Ill. When inquiring specify CP 3121 on handy form, pages 2 and 3.

### Catalog shows complete line of iron, bronze valves

Entire line of bronze and iron body valves are described in 112-page, fabrikoid-bound catalog. Listings are complete on each page, eliminating tedious inter-page references, and including photographs, diagrams, prices, weights, sizes, and dimensions. Added sections describe accessories, and give much essential engineering data. Catalog 50V is issued by Stockham Valves and Fittings, Dept. CP, Box 2592, Birmingham 2, Ala. When inquiring specify CP 3122 on handy form, pages 2 and 3.

### Welding with bronze electrodes explained and illustrated

Twenty-four-page reference and instruction book includes technical information about line of bronze electrodes, as well as information on recommended welding techniques, welding procedures, and machining suggestions. Charts cover selection, preheating, and weldability. Bul-

## Sweet's File for the Process Industries

1

### processing equipment

crushing and grinding a  
mechanical separation b  
drying and forming d  
heat transfer e  
fabricated plate f  
non-metallic g

2

### mechanical equipment

material handling a  
power transmission b  
pumps and compressors c  
pipe and fittings d  
valves and traps e  
instruments and controls f  
lubrication g  
miscellaneous equipment and supplies h

3

### electrical equipment

motors and generators a  
controls b

4

### materials

metals a  
glass c  
thermal insulation d  
refractories e  
roofing and siding g  
waterproofing and dampproofing h  
flooring and wall covering i  
paints and finishes j  
other material k

5

### structural equipment

structural systems a  
doors and hardware b  
skylights and ventilators c  
partitions, fences and guards d  
chimneys e

6

### plant utilities

power generation a  
water conditioning, sewage and refuse disposal b  
air conditioning and refrigeration c  
lighting d  
protection and communication e

7

### service equipment, special services

service equipment a  
special services b

looking for



# for plant utility and service equipment?



## reach for Sweet's

All these manufacturers' catalogs—containing comprehensive information on power generation, water conditioning, sewage and refuse disposal, air conditioning, refrigeration, protection, communication, lighting and service equipment—are instantly available in Sections 6 and 7 of your Sweet's File for the Process Industries.

The other sections of this Sweet's File contain additional catalogs covering a wide range of materials and equipment... useful and up-to-date information on product forms, characteristics, performance and use.

This grouping of manufacturers' catalogs, in sections according to products or use of products, is made for your convenience, so that you can more readily compare one product with another. Indexes of manufacturers, products and trade names lead you quickly and easily to the catalogs you are looking for.

Sweet's is working constantly to get more manufacturers to send you their catalogs in this easy-to-use form. If you fail to find what you want, please tell us.

# Sweet's catalog service

DIVISION OF F. W. DODGE CORPORATION

119 WEST 40th STREET NEW YORK 18, N. Y.

When inquiring check CP 3123 on handy form, pgs. 2-3

## NEW LITERATURE

letin W-17 is issued by Ampco Metal, Inc., Dept. CP, 1745 S. 38th St., Milwaukee 46, Wis. When inquiring specify CP 3124 on handy form, pages 2 and 3.

### Presents Insulated piping

Eight-page bulletin describes and illustrates insulated piping, both complete systems and individual units. Piping is prefabricated and sealed, and may be used for underground or overhead service. Featured are units given an inner corrosion-resistant surface by heavy, sprayed and baked coating of phenolic resin. A.I.A. File 37b 61 is issued by The Ric-wil Company, Dept. CP, Union Commerce Bldg., Cleveland 14, O. When inquiring specify CP 3125 on handy form, pages 2 and 3.

### Slide action featured in four-inch vise

Bench vise described in 4-page, 3-color bulletin combines slide action with conventional screw action, eliminates "handle spinning". Jaw has 1-1/8" travel from any contact position for such operations as pressing in pins or bushings. Available only in 4" size, with swivel or fixed base.

Illustrations and parts list are included in Bulletin A-601, issued by Dodge Manufacturing Corporation, Dept. CP, Mishawaka, Ind. When inquiring specify CP 3126 on handy form, pages 2 and 3.

### Details handling techniques for multiwall paper bags

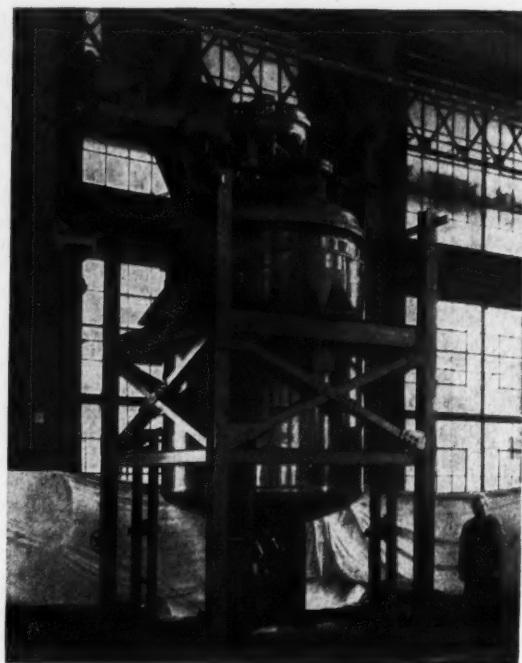
Twenty-page booklet describes and illustrates ways to use all types of multiwall paper bags more efficiently and economically. Information is included on storage of empty bags, filling, closing, handling of filled bags, palletizing, and many other related topics. "Multiwall Packaging Guide" is issued by Bemis Bro. Bag Co., Dept. CP, 408 Pine St., St. Louis 2, Mo. When inquiring specify CP 3127 on handy form, pages 2 and 3.

### Gives pertinent data about gears

Gears are the subject of 15-page booklet that provides machining, designing, and application information. Gear material is available in plate form in sizes up to 36 x 36", with thicknesses from 1/32 to 10". It can also be obtained as blanks cut from plate.

Various tables, including physical properties table, preferred pitch table, and gear-data table for full depth teeth, are contained in Booklet B-4661, issued by Westinghouse Electric Corporation, Dept. CP, Box 2099, Pittsburgh 30, Pa. When inquiring specify CP 3128 on handy form, pages 2 and 3.

**BUFLOVAK-DOPP KETTLES**  
with Double Motion Agitators  
**SAVE Time and Production Costs**  
in Processing Heavy Viscous Materials



2750-Gallon BUFLOVAK-DOPP Grease Kettle.

Investigate these BUFLOVAK Features for your processing problem:

- \* Thorough mixing, freedom from lumps and stratification . . . quickly and efficiently.
- \* No local overheating.
- \* Increase of heat transfer rates for rapid heating and cooling cycles.
- \* Easy and rapid discharge of material.
- \* Safe, quiet operation.
- \* Sturdy construction . . . dependable operation . . . low maintenance cost.
- \* Built in sizes from 1-gal. laboratory units to largest plant size kettles.
- \* Facilities available for pre-testing operation.

Write for complete information.

**BUFLOVAK EQUIPMENT DIVISION**

of Blaw-Knox Company

1645 Fillmore Ave.

Buffalo 11, N.Y.

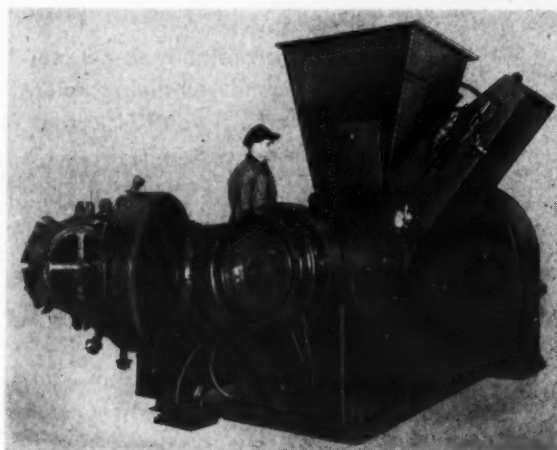
## Banbury Operator Alone Can Control Mixing, Straining, Extruding, Soaping, Stacking of Rubber Stocks

**Strainer-extruder unit completely eliminates need for manual handling of stocks through processing**

**USES:** Strainer-extruder unit is intended to take the place of the conventional mill (or mills) in a customary rubber-processing straining system (Fig. 1). One such mill is usually located under the Banbury mixer for the purpose of reducing the temperature of discharged batches of rubber and sheeting them into slabs prior to dusting and stacking. Two additional mills are generally required whenever it is necessary to strain the stock for producing smooth sheets.

This unit takes the discharge directly from the Banbury and strains it or extrudes it, or both. Systems making use of the unit can be set up to automatically handle all operations — from mixing in the Banbury, through straining, extruding, soaping, and finally stacking the rubber stock.

**Features:** Outstanding feature of a system employing the strainer-extruder unit is that the Banbury operator alone can control the entire system. Manual



Strainer-extruder intended to take the place of conventional mill (or mills) in a customary rubber-processing straining process

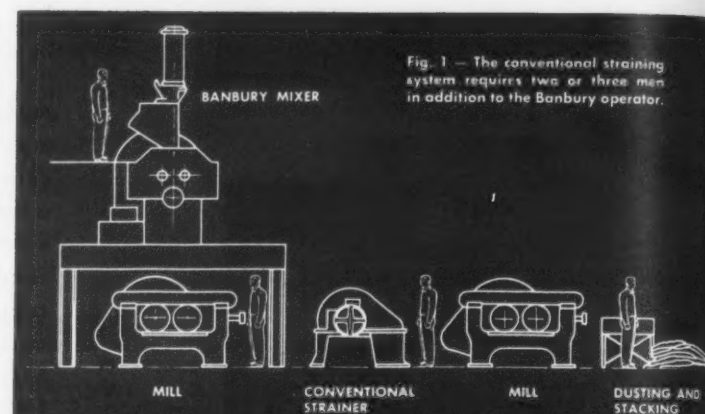


Fig. 1 — The conventional straining system requires two or three men in addition to the Banbury operator.

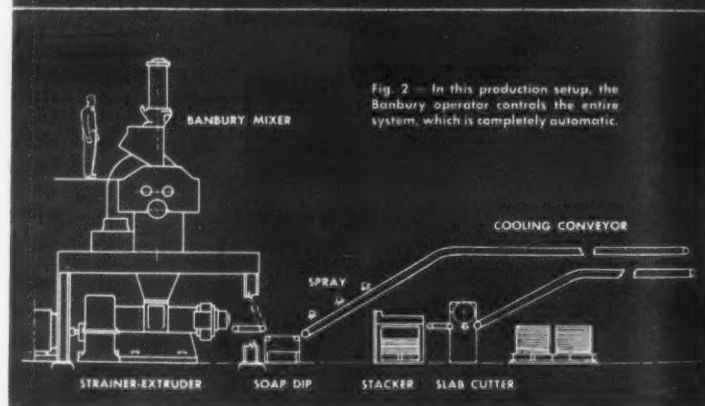


Fig. 2 — In this production setup, the Banbury operator controls the entire system, which is completely automatic.

handling of the rubber stock is completely eliminated. This is a sharp contrast to the customary system where at least 2 or 3 men are required in addition to the Banbury operator, and considerable manual handling of stock is required even with the use of conveyors.

A study of Fig. 2, here, will reveal the savings in manpower that can be effected, as well as the smooth, continuous flow of production in the system.

**Description:** Strainer-extruder shown in the photo is made in sizes to match the capacities of sizes 3A, 9, and 11 Banbury mixers. Hoppers will take batches either direct from the mixer, or by conveyor. Constant feed to the screw is provided by an air-operated ram in the hopper.

Combination strainer-extruder head is hinged to the main cylinder and secured by a hydraulically operated breach-lock mechanism. Extruder head section, in turn, is hinged to the strainer head and secured with swing bolts. Maker reports screens are readily changed.

Main cylinder and extruder head are cored for steam or

water circulation. Screw is drilled and provided with a rotary joint and distributor pipe for further temperature control. Flutes of the screw deliver the stock free of air pockets and with a minimum increase in temperature.

Extrusion is generally in tube form, which is split to form a strip of stock 20-30" wide and approximately 3/8" thick. Center cone of the die is adjustable so that thickness can be varied. Other extruded shapes can be obtained by changing the extruder head section. An auxiliary head (not illustrated) is used for neoprene stocks; it is streamlined to cause continuous flow and minimize setting-up of stock.

In the event straining isn't required, the unit can be supplied only as an extruder for producing slab stock, or some other stock shape.

System will handle master batch or fully compounded stock, providing it will not set-up rapidly.

When the strainer-extruder unit is hooked-up with a cooling conveyor incorporating a dip unit, slab cutter, and stack cutter, batches from the Banbury are automatically strained, extruded, soaped, and neatly stacked.

Source: Development of Farrel-Birmingham Company, Inc., Dept. CP, Ansonia, Conn. . . . or for more information check CP 3131 on handy form, pages 2 & 3.

#### Flux density of electromagnet very high for unit's size . . .

compact device for research has pole pieces that are readily interchangeable

**Uses:** Has following research applications: magnetic moment studies of nuclei, measurement of magnetic anisotropy, magnetic susceptibility experiments on both paramagnetic and diamagnetic salts, microwave absorption in paramagnetic and ferromagnetic materials, magneto-optics such as Zeeman Effect studies, study of magnetic properties of colloids and suspensions.

**Others are:** determination of ferromagnetic impurities, determination of carbon content in steels, adiabatic demagnetization to obtain temperatures below 1°K, studies of paramagnetic saturation at low temperatures, investigation of anti-ferromagnetism or meta-magnetism at low temperatures, permeability determinations at high flux densities, and studies of living organisms in magnetic fields.

**Features:** Produces very high flux densities for its size. For instance, the two-ton electromagnet produces the same magnetic fields as other electromagnets weighing 15 to 50 times as much. All components, including automatic controls and safety devices, are in one cabinet that is connected into power and cooling lines. Pole pieces are easily interchangeable to obtain a variety of field patterns. Accurate, easily installed spacers permit close control of air gap.

**Description:** The ADL electromagnet incorporates notable features of American and European design. It is made in two styles, a rotating, adjustable-height model and a fixed-height model. Typical characteristics are given in the following table.

Field Strength	Pole Face Diameter	Air Gap	Power Rating
35,000 gauss	5 3/4"	2"	125 kw
30,000 gauss	1"	1"	20 kw
10,000 gauss	11"	3"	20 kw
30,000 gauss	5 3/4"	2"	50 kw

Source: Development of Arthur D. Little, Inc., Dept. CP, Cambridge 42, Mass. . . . or for more information check CP 3132 on handy form, pages 2 and 3.

FEBRUARY, 1951



*Remember* — only genuine  
**TUBE-TURN** Welding Fittings are  
identified by these trade marks!

tt and TUBE-TURN are trade marks of Tube Turns, Inc.

## Unique forging process gives strength

**T**UBE-TURN WELDING FITTINGS have a close-grained metal structure fully as strong as the pipe to which they are welded. Welding elbows, for example, are forged by the only process that achieves wall thickness as uniform as the original seamless pipe . . . guaranteeing *full strength throughout*. And, their true circularity means accurate alignment, regardless of angle, for strong, tight, permanently leakproof connections.

*Forged-in* strength is inherent with all types of TUBE-TURN Welding Fittings. It's one of the big reasons why it pays to specify them for *all* jobs. Get in touch with your nearby TUBE TURNS' Distributor. You'll find one in every principal city.

"Be sure you see the double tt"

**TUBE TURNS, INC.** LOUISVILLE 1,  
KENTUCKY

DISTRICT OFFICES: New York • Philadelphia • Pittsburgh • Chicago • Houston • Tulsa • San Francisco • Los Angeles  
TUBE TURNS OF CANADA LIMITED, CHATHAM, ONTARIO . . . A wholly owned subsidiary of TUBE TURNS, INC.

When inquiring check CP 3133 on handy form, pgs. 2-3



## why Pennsylvania makes many types of crushers

Crushing problems are seldom, if ever, identical because of variables such as product, feed size, capacity, moisture content, and physical and chemical structures of material—and no one type of crusher can meet all of them. That's why Pennsylvania has a large and varied line, a portion of which is illustrated here. In this line there is a type of crusher adapted to deal with each individual job no matter what it may be, and since our engineers are not limited to only one or two types when making a recommendation, you can be assured there is no bias or prejudice in favor of a specific crusher. This is one of the very good reasons to at least get Pennsylvania's counsel on every crushing job. Even if you aren't ready for a new crusher we'll be glad to check your operation and report on its efficiency. This could well be the first step towards reducing your operation costs.

### REVERSIBLE HAMMERMILL

The Pennsylvania Reversible Hammermill with 2 Zone Crushing and Adjustable Cage offers great economy in operation and maintenance while producing a coarse or medium fine product without using a closed circuit system. The Reversible feature virtually makes this machine two crushers in one. Press a button—today clockwise—tomorrow, counter clockwise. Send for Bulletin 1034.

### SINGLE ROLL

Requiring surprisingly little headroom, Pennsylvania Single Roll Crushers are powerful machines that have big hourly capacities at low cost per ton and can handle wet, sticky and frozen materials without choking or jamming. Massive Breaker Plate is easily adjustable to or from the Crushing Roll. This permits product size change at any time and also compensates for gradual wear of working parts. Send for Bulletin 2011.

### KUE-KEN JAW CRUSHER

The improved design of the Kue-Ken Jaw Crusher, using the "crushing without rubbing" principle, is the one great advancement in jaw crushers in many years. It replaces the old, poorly lubricated, slow speed, unavoidably heavy machine that gave operators a low opinion of the jaw. The Kue-Ken gives you—2 to 5 times greater capacity, 5 to 10 times longer jaw plate life, much lower power requirement, a completely enclosed oil bath lubrication with clean, constantly filtered oil, and other features that put the Kue-Ken way out in front. Send for Bulletin 5011.

### DIXIE NON-CLOG HAMMERMILL

Wherever sticky, wet materials may be encountered, there the Dixie Non-Clog Hammermill is without parallel in efficiency. The moving, extended Breaker Plate keeps the most difficult mucky feeds from choking the mill and moving right along, holding production at peak capacity. The crushing is done on the numerous moving Breaker Plates, therefore wear is distributed over a large area, prolonging plate life, thus reducing maintenance cost.

### REVERSIBLE IMPACTOR

The Pennsylvania Reversible Impactor reduces by direct impact at controlled slow speeds, producing cubed particles uniform in size. Reduction ratio is quite large, a reduction of minus 10" feed to 1/4" in one operation is not unusual (closed circuited with external screening or separating equipment). This is an ideal crusher for high silicas and abraive rocks, clinkers, minerals and chemicals. The Reversible Rotation feature doubles the life of principal working parts. Send for Bulletin 6016.

**PENNSYLVANIA CRUSHER COMPANY** • Division of Bath Iron Works Corporation • 1717 Lincoln Liberty Bldg., Philadelphia 7, Pa. New York • BOSTON • PITTSBURGH • BIRMINGHAM • ROANOKE • DETROIT • CHICAGO • ST. LOUIS • CROSBY, MINN. • LOS ANGELES • LONDON, ENGLAND

Single Roll Crushers • Reversible Impactors • Reversible Hammermills • Ring-Type Granulators • Bradmills • Bradford Hammermills • Kue-Ken Jaws • Kue-Ken Gyrocones • Dixie Non-Clog Hammermills • Dixie Feed Mills and Process Grinders

**PENNSYLVANIA**  
CRUSHER COMPANY

# PENNSYLVANIA CRUSHERS

## PROCESSING EQUIPMENT

### Stellite parts featured in reducing valve . . .

main valve and seat ring faced with Stellite to resist wear

**Uses:** Reducing valve for pressures to 6000 psi. Handles water, oil, air.

**Features:** Stellite-faced main valve and seat ring resist both abrasion and corrosion.

**Description:** Body is steel; other inner parts are of chrome-plated stainless steel.

Pressure on seat is balanced by a piston above.

**Source:** No. 197-135 Type E reducing valve is made by Atlas Valve Co., Dept. CP, 282 South St., Newark 5, N. J. . . or for more information check CP 3134 on handy form, pages 2 and 3.



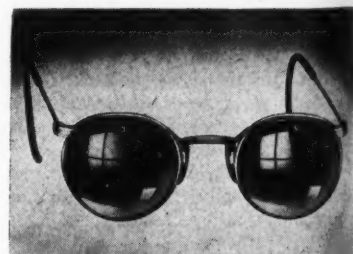
### Side shields are optional on safety goggles . . .

lenses may be prescription type

**Uses:** Metal safety goggles providing eye protection from flying particles.

**Features:** Light and yet strong.

**Description:** Goggles are supplied in 3 standard eye and 5 standard bridge sizes. Clear or darkened lenses



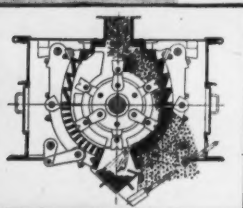
Safety goggles protect eyes

are available, and lenses may be ground to prescription. Side shields are optional.

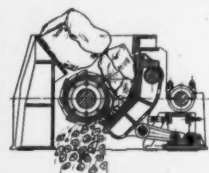
**Source:** F4100 goggle is made by American Optical Company, Dept. CP, Southbridge, Mass. . . or for more information check CP 3135 on handy form, pages 2 and 3.

For more information on product at left, specify CP 3136 . . . see information request blank between pages 2-3.

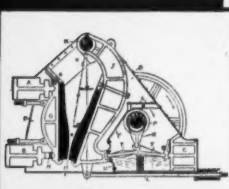
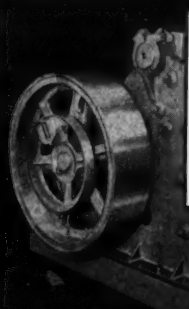
# What type of crusher do YOU use?



Pennsylvania Single Roll



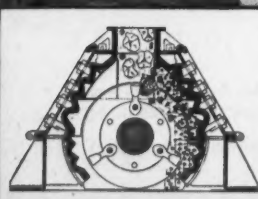
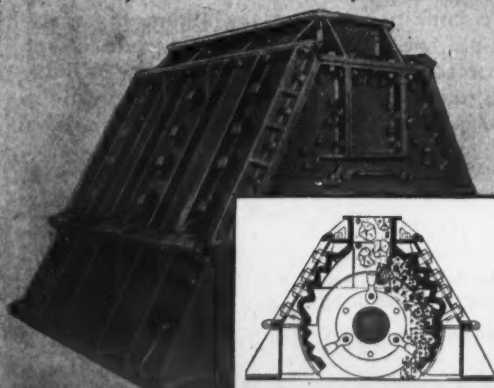
Kue-Ken Jaw



Dixie Non Clog Hammermill



Pennsylvania Reversible Impactor



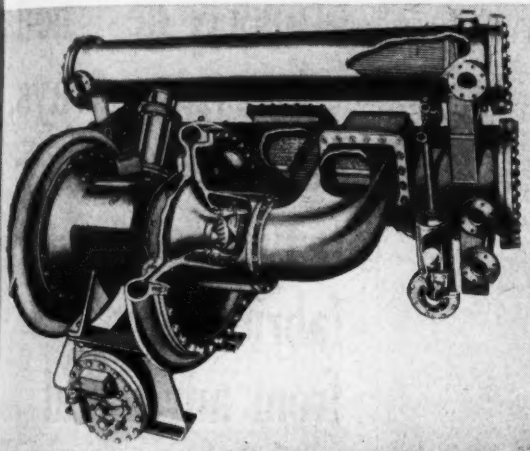
### Economies in operation of refrigeration units due to hermetic sealing . . .

centrifugal water-chilling units for air conditioning systems have capacities to 190 tons

**Uses:** Centrifugal water-chilling units for air conditioning systems. Capacities of 5 different sizes cover the range between 45 and 190 tons of refrigeration.

**Features:** Substantial operating, maintenance, and installation economies are afforded through hermetic-sealed design, maker reports.

**Description:** "CenTraVac" centrifugal refrigeration units use F-113, a member of the stable Freon refrigerant family. They are presently being offered in five sizes with exit chilled water temperatures ranging from 40 to 52°.



Cutaway view shows construction of hermetic centrifugal refrigeration unit

and exit condenser water temperatures ranging from 80 to 100°. Capacity ranges for these sizes are respectively 45-55, 65-95, 95-125, 115-155, and 140-190 tons of refrigeration.

Installation work can be done by steamfitters and electricians because the units' compressor-motor assemblies are shipped hermetically sealed.

Maintenance is reduced to a minimum by the hermetic sealing which eliminates shaft seals. Maker reports that these units have been in service for more than 5 cooling seasons without either internal inspection or operation of their purge pumps.

Operation of units is both quiet and vibrationless. This is particularly important where installation is to be made in existing buildings, next to offices for example. Any floor that will support their dead weight will suffice.

An important contributor to operating economy is the capacity control, composed of variable vanes in the inlets of both low and high compression stages. Efficiency is assured from 100% down to approximately 10% of overall capacity.

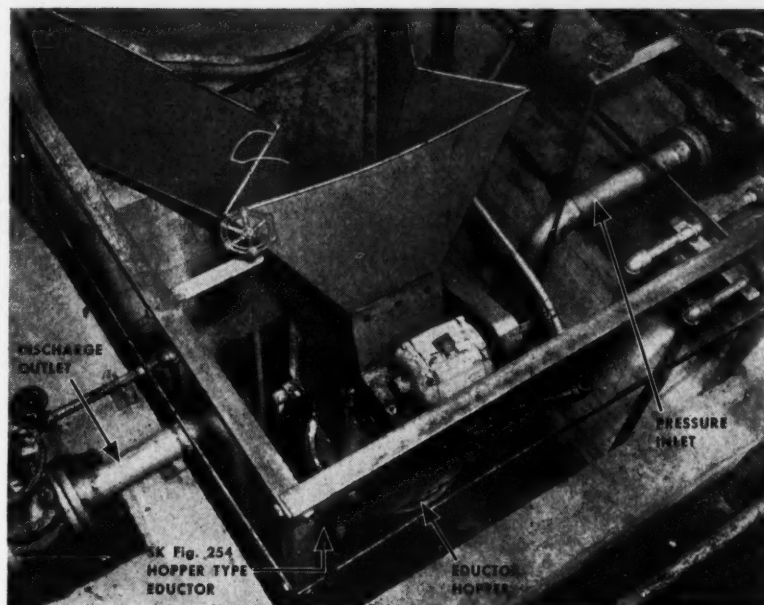
"CenTraVac" can be started or stopped by push button control, or can be controlled thermostatically to modulate, start, and stop automatically in order to maintain a constant temperature in the cooling water supplied to the air conditioning system.

**Source:** Products of The Trane Company, Dept. CP, La Crosse, Wis. . . . or for more information check CP 3137 on handy form, pages 2 and 3.

FEBRUARY, 1951



## Esso Standard Oil Co. Uses SK Eductor To Outmode Hand Mixing



In the manufacture of certain chemicals made from petroleum derivatives, the Bayway Refinery of Esso Standard Oil Company at Linden, N. J. found it necessary to add and mix large quantities of granular dry solids in a liquid stream.

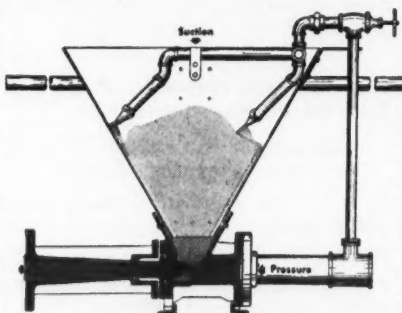
Prior to installation of an SK Fig. 254 Hopper Type Eductor, illustrated, this mixing was done by hand. Economies of the new method were immediate and

gratifying: labor for mixing was eliminated; mixing time was reduced; efficient mixing was obtained; and area appearance was improved.

The 3" Eductor, shown in the photo and in detail in the drawing, is located in a concrete pit. Liquid is pumped from a feed tank by means of a centrifugal pump through the eductor and back into the feed tank. During this liquid re-circulation, granular dry solids are added to the stream until proper ratio is obtained, at which time the liquid is pumped from the feed tank directly into the storage tank, by-passing the eductor.

The Bayway Refinery has mounted a rotary crushing machine atop the eductor hopper for the purpose of crushing large particles into sizes suitable for feeding into the hopper of the eductor and from there into the eductor chamber. The installation handles 72 lbs. per minute of solids with 100 gpm of liquid at 50 psi gauge maintaining a 20 ft. head at discharge.

For details on all types and sizes of SK Eductors, request Bulletin 2-M.



## HAVEG SPARGER NOZZLES RESIST CHEMICALS, GIVE EVEN TANK TEMPERATURE

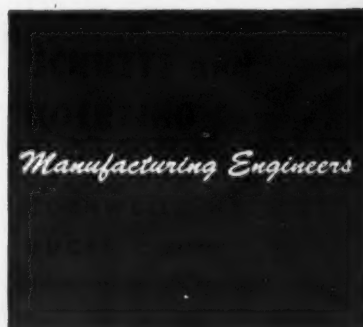
Recent installations in industrial plants show that definite savings can be realized by using SK Haveg Sparger Nozzles in the tank heating of certain chemicals and acids.

Molded in one piece from Haveg 41 or 60 with 1/2" connection for threading in Haveg threaded pipe, these nozzles can handle any temperature up to 265° F.—the corresponding steam pressure in such case being 25 psi.



In addition to cutting replacement costs resulting from corrosion and excessive wear, SK Haveg Sparger Nozzles offer quiet operation, more intimate mixing, and maintain more even tank temperature. Steam, issuing from the Haveg Sparger Pipe through the tip of the steam nozzle at high velocity, entrains tank liquid through the open areas on each side of the nozzle. The steam and tank liquid enter the nozzle chamber where they are thoroughly mixed and discharged with sufficient force to cause constant agitation and uniform heating within the tank.

SK Haveg Sparger Nozzles are available from stock. Request details.



When inquiring check CP 3138 on handy form, pgs. 2-3

# Now... PYREX BRAND

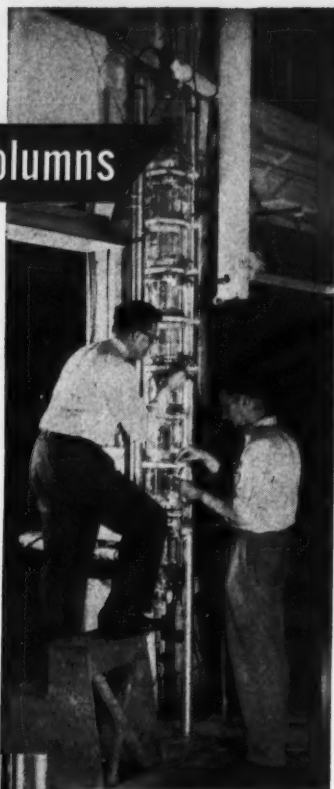
## Glass Fractionating Columns

### For efficient corrosion-free, visible operation

Here is a practical solution to a wide variety of fractionating and absorption problems—for laboratory, pilot plant and commercial operations—where positive protection against corrosion and product contamination is required.

Made of PYREX brand glass, these fractionating columns permit visual observation of flow and performance. Gas and liquid samples may be taken at any time without disturbing operation in any way.

With a throughput of 20 to 25 gallons per hour, PYREX fractionating columns are available in 4" and 6" sizes with any number of bubble and sampling plates.

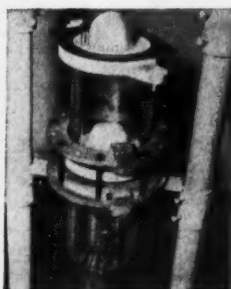


Sampling Operating Column

These units provide maximum chemical stability and high resistance to both physical and thermal shock. Corning supplies complete glass column and metal accessories except 2" iron pipe support.

Standard packed columns are available in 4", 6", 12" and 18" dia. sizes, which may be packed with PYREX brand glass Rachig Rings.

Over-all cost is relatively low compared with other corrosion resistant materials. Mail coupon below.



Sampler Plate and Downcomer Bottom Section



Visible Operations

#### COMPARATIVE EFFICIENCY OF 6" PLATE COLUMN

SYSTEM	OVERALL PLATE EFFICIENCY	PRESSURE DROP/PLATE
Benzene; Carbon-Tetrachloride	Vapor Velocity (ft/sec) % Efficiency	Vapor Velocity (ft/sec) In. of liquid at boiling pt. for static seal* of 3/4 in.
	0.3 52	0.1 .8
	0.5 63	0.3 1.1
	0.6 63	0.5 1.3
Methyl-cyclohexane; Toluene	0.3 85	
	0.5 82	
	0.6 80	

\*Static seal is distance from top of slot to top of downcomer.

CORNING GLASS WORKS

CORNING, N. Y.



#### CORNING GLASS WORKS

Dept. CP-2, Corning, N. Y.

Please send me Data Sheet on PYREX Fractionating and Packed Columns.

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_  
ZONE \_\_\_\_\_ STATE \_\_\_\_\_

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Laboratory Glassware,  
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Lightingware, Signalware,  
Gauge Glasses,  
Optical Glass,  
Glass Components

1851 • 100 YEARS OF MAKING GLASS BETTER AND MORE USEFUL • 1951

When inquiring check CP 3139 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

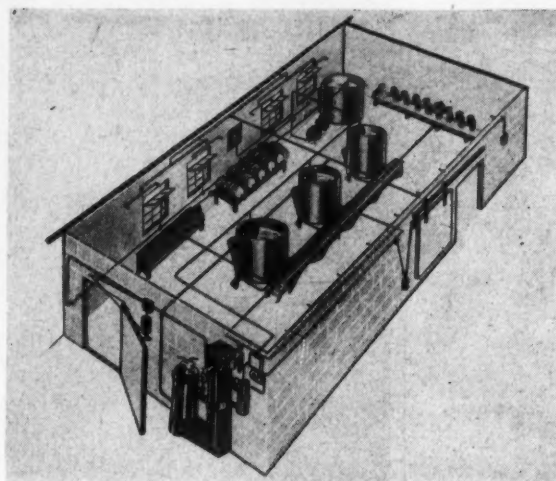
### Nitrogen drives dry chemical through piping system to fight fires . . .

automatic controls may be added to perform valuable secondary operations, such as ringing an alarm

**Uses:** Dry chemical piped system for combatting fires in such large and permanent installations as paint dip tanks, spray booths, ovens, oil quench tanks, pumping stations, transformers, diesel and gasoline engines, printing presses, oil storage tanks, and flammable-liquid storage rooms.

**Features:** Automatic controls may be added to perform valuable secondary operations. Mechanical controls can close doors, windows, and ventilation ducts; electric controls can shut off motors and fans, sound alarms, and transmit signals to central stations or fire alarm HQ.

**Description:** System is actuated by rate-of-rise type of heat actuated device. When fire starts and temperature increases, air expands within this device. It in turn trips



Shows use of piped system on typical flammable-liquid storage room

nitrogen cylinder release, pressurizing the dry chemical container. Dry chemical is then discharged onto fire area through strategically located distribution heads. Provision is also made for manual operation.

Each system is designed to specifications. Operation is independent of power lines, is not subject to power failure. Unit can be recharged on the spot after functioning. Residue inhibits possible reflash.

**Source:** Dry chemical piped system is product of Ansul Chemical Company, Dept. CP, Marinette, Wis. . . or for more information check CP 3140 on handy form, pages 2 and 3.

### Easy to install remote control for variable speed drives . . .

all components furnished in handy package; remote indicator is optional addition

**Uses:** For use with maker's variable speed electric power drives.

**Features:** Package unit design permits mounting on any size drive right in the field. Available with or without electric remote speed indicator.

**Description:** Drives are available in ratings from 1/2 to 25 hp and with 2:1, 3:1, or 4:1 speed variation in a range

Why look further  
for special  
metal assemblies?  
Call Cambridge  
your approved  
source for  
properly designed  
crates, trays,  
baskets, racks or  
fixtures--expertly  
fabricated  
from any metal  
or alloy...

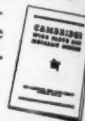


for processing your products or materials in bulk, through liquids, heat, gases or corrosive agents.

Submit your own blueprints for quotation, or merely give us the details of the process for which the assembly must be designed. Our trained engineers and metalworkers will do the rest.

Look under "Baskets—Wire" in your Classified Telephone Directory to call your Cambridge Field Engineer, or write direct.

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**The Cambridge Wire Cloth Co.**  
Dept. F • Cambridge 2, Md.

WIRE CLOTH METAL CONVEYOR BELTS SPECIAL METAL FABRICATIONS

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

When inquiring check CP 3141 on handy form, pgs. 2-3

CHEMICAL PROCESSING



## FEON Nylon FILTER CLOTH Saves \$9,000 A YEAR

A chemical manufacturer had been spending \$1600.00 every eight weeks on heavy cotton filter cloth from which he obtained less than one week's life. Now using FEON Nylon filter cloth he gets a life of eight weeks and has reduced costs to only \$200.00 for the same period—a saving of \$9,000 per year!

### FEON FITS Your FILTER

FEON synthetic filter cloths are made by Filtration Fabrics Division to fit all makes of vacuum and pressure filtration equipment. Since FEON is stronger and more resistant to abrasion and mechanical abuse, a lighter cloth (usually more efficient than a heavier cloth) can often be selected.

GET STARTED  
NOW

FILTRATION FABRICS DIVISION  
Filtration Engineers, Inc.  
155 Oraton St., Newark 4, N. J.

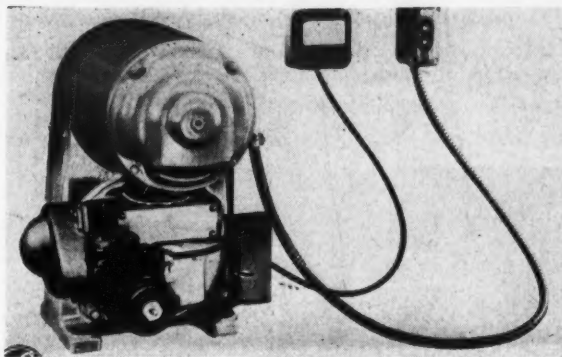
We'd like more facts on  
FEON cloth for:

Type of Filter .....  
Size .....  
Chemical Conditions .....  
Temperature .....  
NAME .....  
TITLE .....  
COMPANY .....  
ADDRESS .....

When inquiring check CP 3142  
on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

of speeds from 26 to 2000 rpm. Positive adjustment of pulleys provides infinite speed variation and a steady flow



Remote control and indicator connected to drive

of power at any selected speed, even under fluctuating loads. Packaged unit includes bracket, reversing motor, chain and sprockets, clutch, and "fast-slow" station.

Source: Remote controls and power drives are built by Sterling Electric Motors, Inc., Dept. CP, Los Angeles 22, Calif. . . or for more information check CP 3143 on handy form, pages 2 and 3.

### Delivers chlorinated water, meters chlorine gas . . .

chlorinizer has maximum capacity of 6000 pounds per 24 hours, comes equipped with many safety features

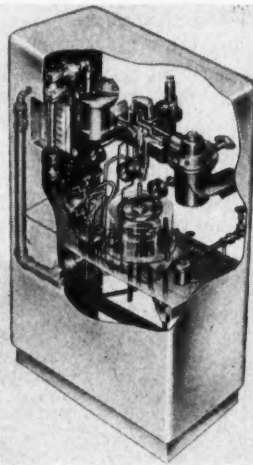
Uses: Equipment for metering chlorine gas at rates from 100 to 6000 lb/24 hr, and for delivering chlorine-water solutions to point of application.

Features: Unit has automatic safety devices which shut off flow of chlorine gas in the event of any condition which would affect safe, accurate operation. Chlorine gas is maintained under vacuum from control valve to injector to minimize the possibility of chlorine leaks.

#### Description:

Chlorinizer is adaptable to semi-automatic, program, or automatic proportional operation. Conversion from one method of operation to any other may be made easily in the field. Rate of flow recorders may be furnished as original equipment or attached later. Unit measures 68" high x 36" wide x 18" deep, has shipping weight of 1000 lb. Standard meter range is 10-1, obtained without changing orifices or scales.

Source: Model HCVS chlorinizer is product of Builders-Providence, Inc., Dept. CP, 345 Harris Ave., Providence 1, R.I. . . or for more information check CP 3144 on handy form, pages 2 and 3.



Interior details of chlorinizer



### WHERE YOUR CORROSION RESISTANT PIPING PROBLEMS ALWAYS FIND THE RIGHT ANSWER

TRI-CLOVER offers over 30 years of specialized experience in solving corrosion-resistant piping problems for Industry. Skilled craftsmen and engineers in four completely equipped plants have made the name *Tri-Clover* on stainless steel and alloy fittings, valves, pumps, and specialties signify unexcelled performance.

Your selection of the *right* fitting, tubing or pipe for the *right* job is made easier by Tri-Clover's complete production and engineering facilities. Benefit from this fact. For here is one dependable source . . . one responsibility for your piping problem.

Remember to specify *Tri-Clover*!



EXPORT DIVISION — 8 So. Michigan, Chicago 3, U. S. A.

*Tri-Clover*  
MACHINE CO.  
Kenosha, Wisconsin

TRIALLOY AND STAINLESS STEEL  
SANITARY FITTINGS, VALVES,  
PUMPS, TUBING, SPECIALTIES

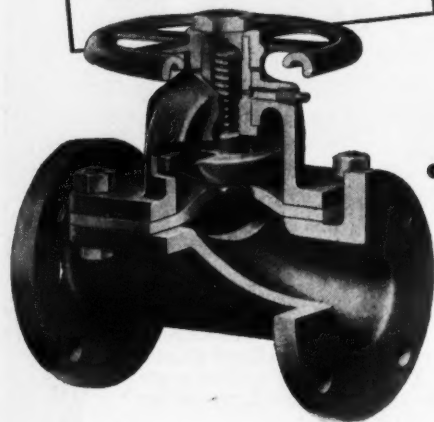
FABRICATED STAINLESS STEEL  
INDUSTRIAL FITTINGS AND  
INDUSTRIAL PUMPS

THE Complete LINE

When inquiring check CP 3145 on handy form, pgs. 2-3

# This Simple Principle

**makes  
HILLS-McCANN  
diaphragm valves  
unexcelled  
for handling  
corrosive materials,  
slurries  
and semi-solids**



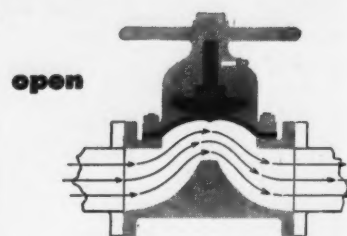
• When it comes to valving hard-to-handle fluids, the simple pinch clamp principle of Hills-McCanna valves (see above) eliminates most ordinary valve troubles. There is no leakage, no packing and material handled cannot contaminate or be contaminated by the working parts. Hills-McCanna Saunders patent diaphragm valves are the answer to many of the most serious valve problems. Write for full details and ask for a copy of Catalog V-48. HILLS-McCANN CO. 2370 W. Nelson Street, Chicago 18, Illinois.

**FOR 66° B6  
SULPHURIC**  
Hills-McCanna  
now offers  
new plastic  
diaphragms for  
handling 66°  
B6 sulphuric.  
Write for details.

**HILLS-McCANN**  
*saunders patent*  
**diaphragm valves**

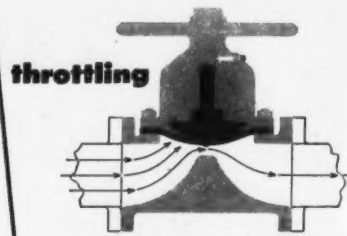
*Also manufacturers of Proportioning Pumps  
Force Feed Lubricators • Magnesium Alloy Castings*

When inquiring check CP 3146 on handy form, pgs. 2-3



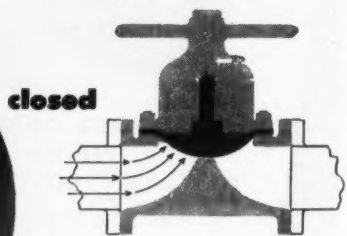
**open**

Compressor is raised, lifting diaphragm by means of a stud molded into the material.



**throttling**

Compressor and diaphragm partially lowered. Compressor design guides and supports diaphragm.



**closed**

Compressor presses diaphragm tightly against weir pinching off flow and making a tight seal.

## PROCESSING EQUIPMENT

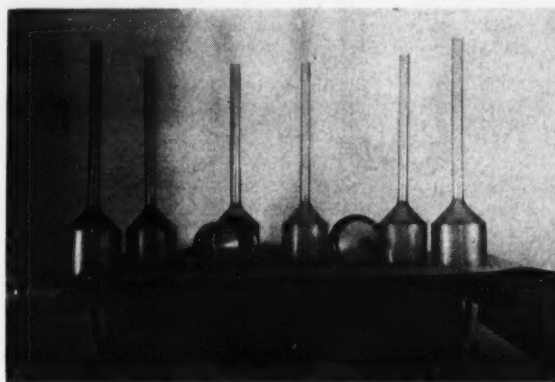
### One-piece plastic funnels resist heat, chemicals . . .

one size is now available, and others are to follow

**Uses:** For service where heat and chemical resistance are factors in transferring materials.

**Features:** One-piece plastic construction.

**Description:** At present one size is available, having



Plastic funnel has 5" upper section, 15" neck

dimensionn for the upper section of 5" outside diameter by 6" long and a neck 1" in outside diameter by 15" long.

**Source:** Applied Resins Corp., Dept. CP, 304 Oraton St., Newark 4, N. J. . . . or for more information check CP 3147 on handy form, pages 2 and 3.

### Deposits chrome plating at rate of .002"/hr at room temps . . .

plating unit handles objects to 10 sq in at current density of 2 amps per square inch

**Uses:** Self-contained equipment for precision chrome plating of small machine tool parts, accessories, and other metal surfaces up to 10 sq in.

**Features:** Operates at room temperatures. No previous plating experience is necessary; deposition can be controlled to tolerances of less than 0.0001".

**Description:** Powered by dry disc selenium rectifier, unit is complete with plating bath tank, rheostat, timer, ammeter, and reversing switch for stripping action. Operates from 110/115 volt, 60 cycle, single phase current.



Gives controlled deposition of chrome on small parts

Equipment is used with non-critical chrome plating solution

## FABLE OF A TABLE

ONCE upon a time (Actually it was very long ago) two men got together across a desk to discuss a problem. (What new about that?)

This particular problem involved powdered dry colors which were being placed in containers from an overhead storage bin.

The one man (a Potential Customer) said these dry colors were sticking and not settling fast enough. The other man (he was from Cleveland Vibrator, of course) said he thought a Cleveland Vibration Table was the answer.

The big deciding point was that, with a Cleveland table, the material could be rushed, moved gently, or slowed down to a walk.

In other words, with Cleveland air vibration tables, the intensity of vibration can be varied at will, thanks to a pressure control regulator.

Perhaps this fable of a table will suggest how you, too, can package your chemicals. Our catalog has more details.



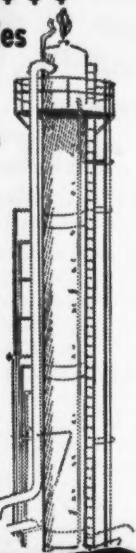
2707 Clinton Ave. • Cleveland 13, Ohio

When inquiring check CP 3148 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## Saving more \$\$\$ in oil refineries

Refinery engineers report dependable performance—day after day—on important cost-cutting reclamation processes... "transfer of bottom sediments in gravity-type oil-water separators to elevated decanting tanks"—"settled oil solids from sludge lagoons"—"cleaning out separator hoppers"—



**CARTER**  
sludge pumps

For processing of "problem" liquids, you will find the Carter sludge pump an actual economy! Specifically designed for handling of solid-laden, viscous and mildly corrosive liquids... practically eliminating emulsification, coagulation and agitation.

If you handle similar liquids—and have a problem... call us in. Our engineering staff will be glad to render a detailed, analytical report—at no obligation! Our latest technical bulletin, No. 5002, is almost ready for press. Gives complete data on sludge pumps—and their application to your problems. May we reserve a copy for you? Write today—on your company letterhead.

187 Atlantic St.

**R. B. CARTER** SALES INC.  
Hackensack, New Jersey

When inquiring check CP 3149 on handy form, pgs. 2-3

FEBRUARY, 1951

## PROCESSING EQUIPMENT

that needs no heating, delivers a hard plate that follows base metal contour. Deposition is 0.002"/hr at recommended current density of 2 amp/sq in. Average time required for most applications is 1½ minutes.

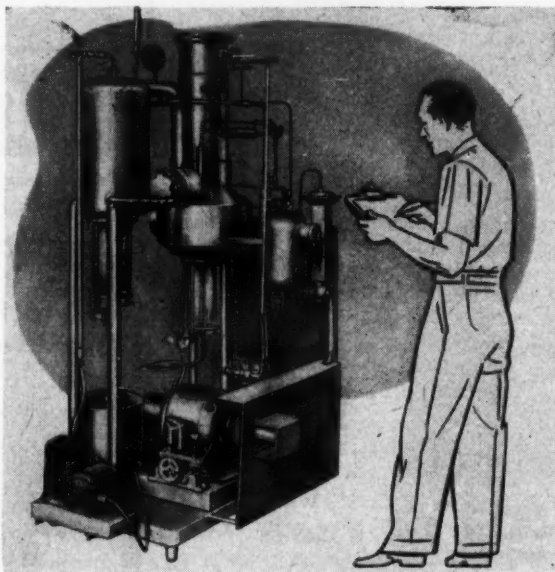
**Source:** Model A-20 Chromaster is made by Ward Leonard Electric Co., Industrial Chrome Div., Dept. CP, 31 South St., Mount Vernon, N. Y. . . . or for more information check CP 3150 on handy form, pages 2 and 3.

### Concentrates heat-sensitive fluids; can evaporate 1/3 lb water per min . . .

temperatures controlled to as low as 50°F or to as high as 100°F; delivers ready for service

**Uses:** Low temperature concentration of small lots of heat sensitive fluids. Low temperature distillation and fractionation of solutions with recovery of both solvent and concentrate. Experimental distillation of flavor extracts and essences.

**Features:** All parts in contact with product or distillate are fabricated of type 302 stainless steel. Entire apparatus is small enough to fit through a typical lab doorway. It is delivered completely assembled and tested, ready to con-



Low temp evaporation-distillation unit

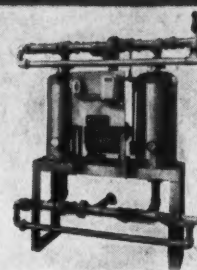
nect to 220 v, 3 phase, 60 c electrical current and regular water supply. Evaporation temperatures can be controlled to as low as 50°F or to as high as 100°F; operation is simple and easily controlled.

**Description:** Capacity is about 1/3 lb of water evaporated per minute. Unit is supplied complete with 3 hp Freon compressor, vacuum pump, product recirculation pump, pressure regulator, gauges, valves, etc. Four cu ft per minute of air at 25 lb pressure are required to operate instruments.

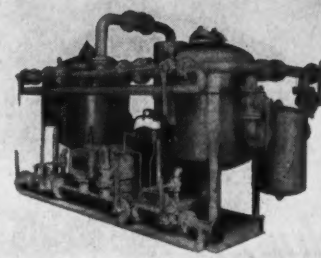
As little as 1 gal of fluid may be concentrated, and 2 gallons can be reduced to 2 quarts in about half an hour. Floor space required is 30 x 42 x 74" high. Weight is 1240 lb.

**Source:** Model LTFL evaporator is built by Mojonner Bros. Co., Dept. CP, 4601 West Ohio St., Chicago 44, Ill. . . . or for more information check CP 3151 on handy form, pages 2 and 3.

## Standard or Special . . .



This Kemp Radiation-Cooled Dryer gives maximum efficiency with minimum maintenance and operating costs. Heating period terminates automatically. Rated: 300 scfm, 100 psig, 70° F.

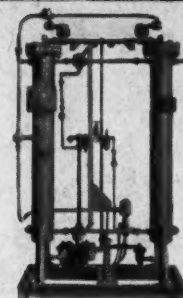


This electrically activated Kemp Dryer is designed so gas stream is not contaminated by air normally used for reactivation. Rated: 3200 scfm, 100 psig, 70° F.

## KEMP can Solve . . .



This Semi-automatic Kemp Oriad Dryer dries air for actuating tools, valves, etc.—dries process air and gases. Rated: 600 scfm, 100 psig, 70° F.



This Kemp Oriad Dryer is controlled by program timer. All operations, including tower reversal, fully automatic. Rated: 100 scfm, 100 psig, 70° F.

## Your Moisture Problem

**DRIES AIR, GASES or LIQUIDS TO NEW LOW DEW POINTS FOR AS LITTLE AS ¼¢ PER MCF**

Whatever you pay for drying air, gases or liquids, check on the economy of Kemp Dynamic Dryers! Hundreds of Kemp Dynamic Dryers control moisture at low cost in plants all over the country. Operation is guaranteed to your specifications. In fact, many Kemp users report drying to sub-zero dew points for as little as ¼¢ per mcf—including all

charges for labor, capital investment and materials!

### Flexible Design

Kemp Dynamic Dryers are versatile — offer manual, semi-automatic or automatic operation. Desiccant is especially selected and compounded for the type drying you require. With Kemp you can dry air, gases or liquids, eliminate moisture in materials, and control humidity in large or small areas. Gas, electric or steam regeneration is supplied as standard equipment.

Find out how Kemp engineering can save you money!

**KEMP DYNAMIC DRYERS**  
OF BALTIMORE

Write For Bulletin D-27 for technical information. Address: C. M. KEMP MFG. CO., 405 E. Oliver St., Baltimore 2, Md.

When inquiring check CP 3152 on handy form, pgs. 2-3



## Here's proof that YALE gives more for your money!

**Only YALE gives you fluid-drive for smooth, powerful operation—longer truck life:**

Now you can get the same efficient power transmission used in expensive passenger cars. Smooth, full power at any speed—even fully loaded on ramps! No jerky stops and starts—you can work in closer quarters, cut down load breakage, reduce driver fatigue, save tires and power transmission parts, lengthen clutch life 3 to 6 times!

**Only YALE gives you this extra-power combination—hypoid gearing—65HP engine:**

Here is a newly developed power team that can handle capacity loads, steep grades, heavy road shock day after day in any weather—and still stay on the job with an absolute minimum of maintenance!

**Only YALE gives you all these exclusive money-saving features:**

Sealed automotive type hydraulic brakes give greater safety. Shockless steering provides easy "passenger car" control. Cold drawn, precision aligned uprights assure smooth, even lifting. Every vital part, in fact, has been designed and developed to give you more truck for your money.

**Now, get your own on-the-job proof:**

Now, when manpower, time and production are at a premium, is the time to see for yourself how much more this amazing new YALE gas fork truck can do for you. Write for complete information today.

**Capacities up to 10,000 pounds**

**YALE**  
MATERIALS  
HANDLING  
DIVISION

The Yale and Towne Manufacturing Co.  
Department No. 122  
Roosevelt Boulevard & Maiden Avenue  
Philadelphia 15, Pa.  
I am interested in cutting my materials handling costs.  
Please have your local representative call on me.  
Please send me FREE detailed literature.  
Name \_\_\_\_\_  
Company \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 3153 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

**Output torque increases as speed decreases in unique variable speed drive . . .**

reversing, non-reversing models consist of motor-generator combination; speed controls are simple

**Uses:** Especially applicable for driving equipment that requires highest torque at slow speeds. Non-reversing model (also available reversible if desired) is rated at 1/2 hp and supplied in speed ranges from 0-250 to 0-1000 rpm. Reversing model is rated at 1/3 hp and supplied in speed ranges from 0-150 to 0-600 rpm. Both drives are for direct coupling.

**Features:** Outstanding characteristic of drives is the fact that maximum torque is obtained at zero speed, with gradual torque decrease as the output speed increases. At the rated speed, torque assumes the rated value. Speed reversal in the reversing model occurs with complete smoothness.

Minimum of maintenance is assured by trouble-free differential gearing, as well as standard make of motor. Unique feature of drives is that they require no complicated controls; simplest standard controls such as potentiometers and rheostats will do.

**Description:** Variable speed drives, known as Specon #OOED, make use of a unique motor-generator combination. Consist of a standard AC squirrel cage motor, 2 standard DC motors (one used as a generator), and a differential gear box. DC motors are connected in a closed loop and require no outside DC source of power.

Minimum output speed of drive is zero, even though the AC and DC motors continue to run. Reversing action occurs only in the differential, direction of rotation in motors remains the same.

**Source:** Product of Dept. A-14 of the Speed Control Corporation, Dept. CP, 1450 E. 289th St., Wickliffe, O. . . or for more information check CP 3154 on handy form, pages 2 and 3.

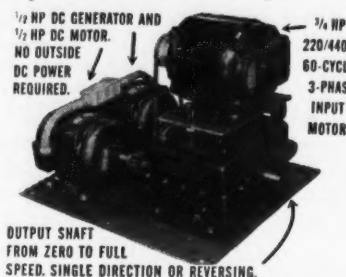
**No increase in size of frame needed for totally-enclosed non-ventilated motors . . .**

meet all applicable NEMA and AIEE standards; cooling achieved by radiation from frames

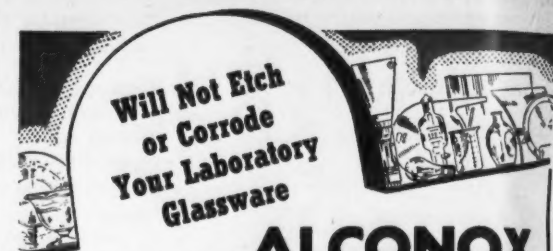
**Uses:** For service where combustible dust, dirt, abrasive particles, metal turnings, corrosive gas or steam are present.

**Features:** Motors are available in totally-enclosed non-ventilated design without increase in frame size. Squirrel winding consists of a one-piece copper alloy centrifugal casting. Symmetrical construction permits easy reversal of stator if necessary to change relative position of conduit box. Cooling is achieved by radiation.

**Description:** This development makes available a totally-enclosed non-ventilated type motor in the same frame size used for open standard motors. Following ratings are offered, with an indication of frame size reduction made available in each case. Table shows comparison between



Shows components of variable speed drive



**ALCONOX**  
the accepted fast-acting cleanser keeps your calibrated glassware intact.

Etching, corroding and weakening of the glass are eliminated. Alconox is ideal for washing all types of laboratory equipment, filters, glass, hypo needles, slides, pipettes, test tubes and other instruments and equipment.

**SAVE TIME — SAVE LABOR with ALCONOX.** Simply wash and rinse. Alconox leaves no streaks or film. It is kind to the skin. Economical too, a spoonful makes a gallon.

**AVAILABLE IN**  
BOX of 3 lb. . . . . Price \$ 1.95  
CARTON (12 x 3 lb.) . . . . . ea. 18.00  
BAG of 50 lb. . . . . lb. .40  
BARREL of 300 lb. . . . . lb. .37  
(Slightly higher on the Pacific Coast)

If your dealer cannot supply you, write for literature and samples.

DEPT. CP2  
**ALCONOX, INC.**

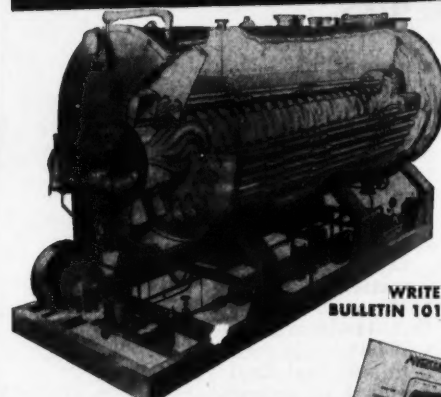
61 Cornellison Avenue

Jersey City, N. J.

**ALCONOX** cleans better  
cleans quicker

When inquiring check CP 3155 on handy form, pgs. 2-3

**AMESTEAM**  
GENERATOR



WRITE FOR  
BULLETIN 1011-CI

- Complete unit
- Fully automatic
- Easily installed
- Highly efficient
- Oil, gas or oil-gas combinations
- 10 to 500 h.p. — 15 to 200 lbs.

**AMES IRON WORKS**

BOX 602, OSWEGO, N. Y.

Builders of Better Boilers since 1848  
Manufactured under  
License in Canada by VOLCANO Ltd. Montreal, P. Q.

When inquiring check CP 3156 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

type QZE motors and NEMA standard for same service (both motors totally enclosed, non-ventilated, 55°C rise).

HP	RPM	QZE Motors	NEMA Standard
2 hp	1200	225	254
3 hp	1200	254	324
3 hp	1800	225	284
5 hp	1800	254	326
7½ hp	1800	284	—

Source: QZE motors are built by Fairbanks, Morse & Company, Dept. CP, Chicago 5, Ill. . . or for more information, check CP 3157 on handy form, pages 2 and 3.

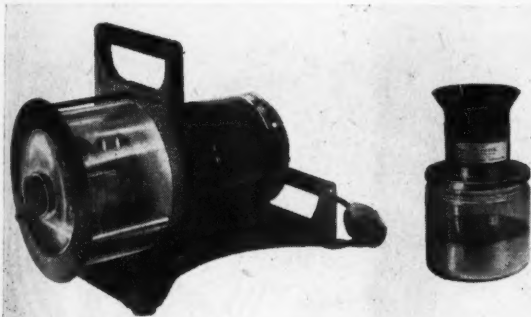
### Mercury cleaned so effectively it can be used in the most exacting instruments . . .

5-lb capacity oxifier and filter designed for mercury users who require small amounts of cleaned metal

Uses: Five-pound-capacity cleaning unit for mercury.

Features: Designed especially for those users of mercury who require only small quantities of the cleaned metal. Cleaning process is reported to be so effective that the mercury is satisfactory for use in exacting scientific instruments.

Description: Mercury cleaning unit consists of an oxifier which can be used with maker's Type G filter. Oxifier violently agitates the mercury for 2 to 4 hours, providing maximum air contact with the mercury droplets. This oxidizes base metal contaminations, forming skins



5-lb mercury oxifier (left) and its filter (right)

which precipitate from the mercury as metallic oxide powders. These are readily separated from the mercury with the filter which operates on the gold adhesion principle, removing such impurities as dust, oxide scums, oil, water, and acid residue.

Where mercury contamination consists merely of floating foreign matter, the filter alone provides effective cleaning.

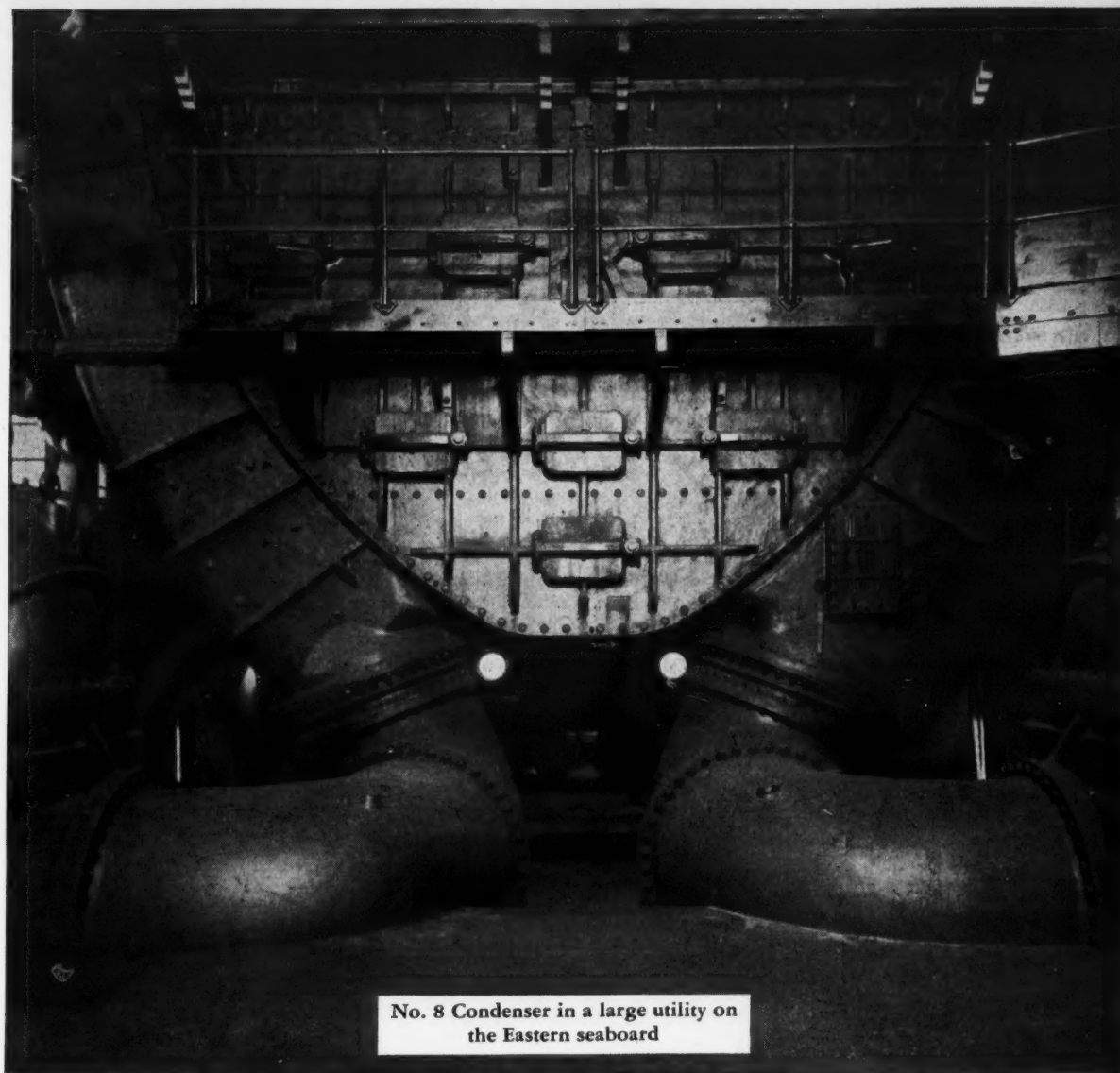
Cleaning unit is compact. Oxifier requires a table space of only 9 x 5", stands 7" high, weighs 8 pounds, and is powered by a 1/70 hp motor which operates on 115-volt 60 cycle AC lines. Filter weighs 1 pound 8 ounces, is 3½" diameter and 6½" high.

Oxifier requires attention only at the beginning and end of the cleaning cycle. No special skills are necessary for operation.

The 5-lb mercury oxifier and Type G filter are counterparts to the 25-lb oxifier and Type F filter previously announced.

Source: Development of the Bethlehem Apparatus Company, Dept. CP, Hellertown, Pa. . . or for more information check CP 3158 on handy form, pages 2 and 3.

FEBRUARY, 1951



No. 8 Condenser in a large utility on the Eastern seaboard

## don't let **FOULING**

get your figures **ALL FOULED UP!**

● One important factor taken into account when figuring on the heat-transfer capacity of a condenser is fouling. But the effect of the tube alloy on both rate and amount of fouling is sometimes ignored in design calculations. The acceptance test of a condenser is made with clean tubes. However, the average heat transfer rate varies with time, and fouling is the chief factor in such variation. In many applications this indicates the need for serious consideration of cupro-nickel tubes, which are recognized to have superior anti-fouling characteristics, as well as high resistance to corrosion, erosion, impingement. Thus it can be said that cupro-nickel, 30%, will provide more uniform transfer rates over a period of time, require cleaning much less often, and last longer . . . Revere makes condenser tubes in

cupro-nickel as well as in all the other customary copper alloys. We will gladly collaborate with you in a study of the economics of condenser tube selection to meet your needs for true economy. Write for reprint of article entitled "What Factors Should You Consider in Selecting Condenser-Tube Alloys?"

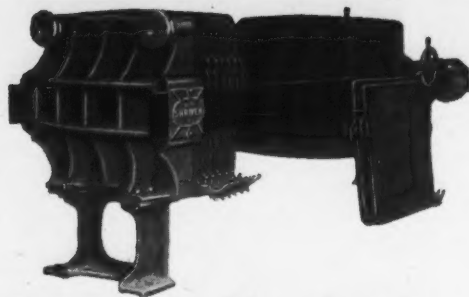
**REVERE** 150<sup>TH</sup> YEAR OF SERVICE TO AMERICA  
**COPPER AND BRASS INCORPORATED**

Founded by Paul Revere in 1801  
230 Park Avenue, New York 17, N. Y.

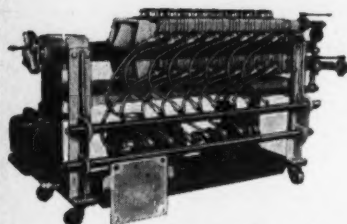
Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.—  
Sales Offices in Principal Cities, Distributors Everywhere.  
SEE "MEET THE PRESS" ON NBC TELEVISION EVERY SUNDAY

When inquiring check CP 3159 on handy form, pgs. 2-3

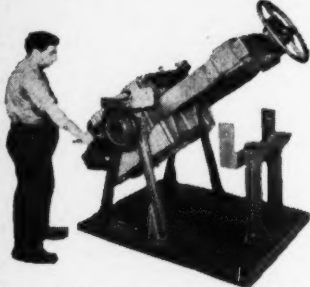
Large Shriver corner feed, open delivery filter press, with rubber-covered metal filter chambers for corrosive materials.



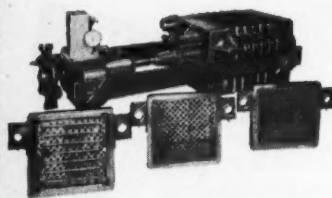
...nor custom stale their infinite variety for...  
*Better Filtration*



Portable steam heated, stainless steel press for filtering and washing; equipped with centrifugal pump.



"Tilttype" press for filtration with chambers in horizontal position and in vertical position for cleaning.



Filter press with special reinforced perforated plates and wire screen to assure free drainage; for filtering film dope at 250 p.s.i. pressure; equipped with Shriver "Hydro-Kloser."

At Shriver's no filter press design is ever really "set"—none that cannot be changed to do a specific filtration job better.

Many good ideas come from users. We develop plenty of our own. New products to filter; faster cycles; higher filtration temperatures and pressures; easier handling; more operations required of one piece of equipment. All these are truly a conspiracy of production circumstances, a challenge we gladly accept and meet.

If yours is a problem in solids recovery, clarification, washing and even drying, for pilot plant or large scale operation, with normal or special processing conditions requiring regular or special designs, materials of construction or filter media, Shriver Filter Presses can bring you definite advantages.



Write for this Catalog

## SHRIVER FILTER PRESSES

T. SHRIVER & COMPANY, Inc., 846 Hamilton St., Harrison, N. J.

We also manufacture wax molding presses; thickeners; diaphragm pumps and oxy-hydrogen generators

When inquiring check CP 3160 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

**Valve lets vibrator work only when discharge gate is open . . .**

vibrators operating on 80 psi used on chutes, tables, hoppers

**Uses:** May be used on hoppers, tables, molding machines, chutes, concrete block machines, and many other diversified types of production equipment.

**Features:** For hopper installations, these vibrators can be used in conjunction with maker's quick-acting hopper-gate-valve, which actuates the



Vibrator offered with long or short stroke

vibrator only when the hopper discharge gate is open. This type of controlled operation prevents accidental packing of hopper contents by premature vibration, conserves air power, and provides for maximum efficient service life.

**Description:** Made in 8 standard sizes. Furnished with long stroke or with standard stroke piston to assure the correct intensity of transmitted power. Designed for operation on 80 psi line pressure. Bodies are cast from semi-steel. Combination end-plate mounting bracket is held in place by 1" alloy steel bolts. In addition, these units employ a special bronze alloy cylinder liner which assures smooth, positive operation and provides capacity for long, hard service. Construction makes these units adaptable for installations requiring continuous or intermittent operation.

Vibrators are made in 2 and 2 1/2" piston diameters. All models are tapped for 1/4" rigid or swivel type straight or ell connector for hose attachment. Catalog #50 gives complete information.

**Source:** Series 79 vibrators are built by Spo, Inc., Dept. CP, 6350 Grand Division Ave., Cleveland 25, Ohio . . . or for more information check CP 3161 on handy form, pages 2 and 3.

## PAINT JOBS LAST LONGER

despite severely corrosive conditions



... because of the high **chemical resistance** in UCILON PROTECTIVE COATINGS

Because Ucilon\* Coatings resist many strong chemicals, users today report they are not only conserving equipment with maximum corrosion protection, but stretching the time between paint jobs as well. For instance . . .

A LARGE ALKALI PLANT has been using Ucilon Coatings extensively for the past several years to combat highly corrosive atmospheres. They report "We have yet to have a failure of any consequence in plant applications."

IN ANOTHER CASE, Ucilon Coat-

ings were applied to steel kept continuously submerged in sewage. Even after 3 years, no sign of coating-deterioration was seen—an unsurpassed record for this application.

Ucilon Coating Systems mean less labor, less downtime, longer life for equipment because they resist most acids, alkalis, salt solutions, moisture, petroleum products, alcohols, fumes, and other corrosives. Coatings are formulated from tough materials—vinyl resins, phenolics, fish oil and other vehicles. Write for more data. \*Trade Mark

## UCILON Protective Coatings

One Group of the Many **UNICROM** COATINGS FOR METALS

UNITED CHROMIUM, INCORPORATED 100 East 42nd Street, New York 17, N.Y.  
Detroit 20, Mich. - Waterbury 20, Conn. - Chicago 4, Ill. - Los Angeles 13, Cal.  
In Canada: United Chromium Limited, Toronto, Ont.

When inquiring check CP 3162 on handy form, pgs. 2-3



*All Electric  
Floatless*

## LIQUID LEVEL CONTROLS

● Write for latest catalog covering the complete line of B/W Induction Relays, Induction Relay Switches, Relay Enclosures, Contactors and Starters, Multiple Pump Controls, Electrode Holders, Starter and Relay Combinations, Special Controls and Panels.

Controls will never trouble you, when you buy B/W

**B/W CONTROLLER CORPORATION**  
2204 East Maple Road, Birmingham, Michigan

FIRST IN THE FLOATLESS CONTROL FIELD

When inquiring check CP 3163 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## PROCESSING EQUIPMENT

### Fills valve bags to preset weights of 25-100 lb...

compact unit fits under mixers, hoppers, chutes; reduces dust; shuts off automatically

**Uses:** Weighs and fills self-sealing paper valve-type bags with powdered, granular, pellet or fibrous materials. Unit is easily adapted for filling open mouth bags, pails, drums and barrels. Used in applications involving continuous or intermittent runs.

**Features:** Fills bags quickly to desired weight without dribble-feeding. Filled paper valve bag, when removed from spout, is immediately ready for shipment. Packer operates by pushbutton control. Operating mechanism shuts off automatically when contents of bag reaches pre-set weight.

Auger assembly is easily removed and replaced. Size and shape of auger used are determined by product to be



Valve bag fits on spout, is filled to pre-set weight packed. As bag slips securely on spout of auger and material is augered in, dust is held to a minimum.

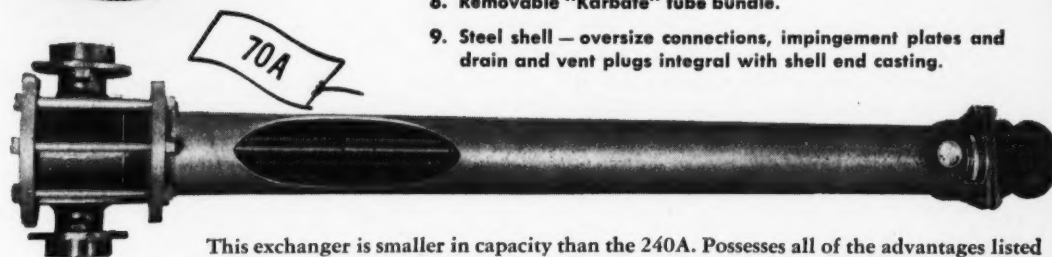
Height of packer is only 45" overall and width is 28". Unit is easily installed under mixers, hoppers and chutes and can be furnished with casters to facilitate transfer from one job to another.

**Description:** Unit is sturdily constructed and has relatively few operating parts. Scale beam counter weights can be set for quantities of 25 to 100 lb. A fine weight adjustment wheel provides for final setting of net and gross weights. In addition to start control button there is an emergency stop button. Indicator lights show when machine is operating and when filling action has stopped.

Motor operates on AC current. Motors can be single speed or two-speed as may be required for individual operating conditions.

**Source:** Auger-Matic pushbutton bag packer is a product of E. D. Coddington Mfg. Co., Dept. CP. 5024 N. 37th St., Milwaukee, Wis. . . . or for more information check CP 3164 on handy form, pages 2 and 3.

# Here's the dope on 2 "KARBATE" IMPERVIOUS GRAPHITE HEAT EXCHANGERS



The new No. 240A is a shell-and-tube heat-exchanger made of "Karbate" brand impervious graphite...similar in construction to the familiar No. 70A... but with almost three times as much total effective external heat transfer surface. Advantages are:

1. 70.6 sq. ft. of external heat transfer surface.
2. Single, double or four-pass routing of tube-side fluid is effected by a simple change of fixed and floating end-cover assemblies.
3. Wide variety of corrosive fluids handled with negligible maintenance.
4. Thermal shock resistance.
5. Very high heat transfer rates.
6. Stainless steel baffles.
7. Easy tube replacement in the field.
8. Removable "Karbate" tube bundle.
9. Steel shell — oversize connections, impingement plates and drain and vent plugs integral with shell end casting.

This exchanger is smaller in capacity than the 240A. Possesses all of the advantages listed above for the 240A. For complete information on these two heat exchangers, write for catalog sections S-6715 and S-6690. Address National Carbon Division, Dept. CP.



A LITTLE PICK-ME-UP OF  
H<sub>2</sub>SO<sub>4</sub> MAY HELP THAT  
INDIGESTION I'VE BEEN  
GETTING FROM 'KARBATE'  
IMPERVIOUS GRAPHITE

The terms "Karbate" and "Eveready" are registered trade-marks of  
**NATIONAL CARBON DIVISION**  
UNION CARBIDE AND CARBON CORPORATION  
30 East 42nd Street, New York 17, N. Y.  
District Sales Offices: Atlanta, Chicago, Dallas,  
Kansas City, New York, Pittsburgh, San Francisco  
In Canada: National Carbon, Ltd., Toronto 4

### SLASH BATTERY COSTS IN HALF

With the revolutionary new "Eveready" No. 1050 Flashlight Battery you get these big exclusive features:

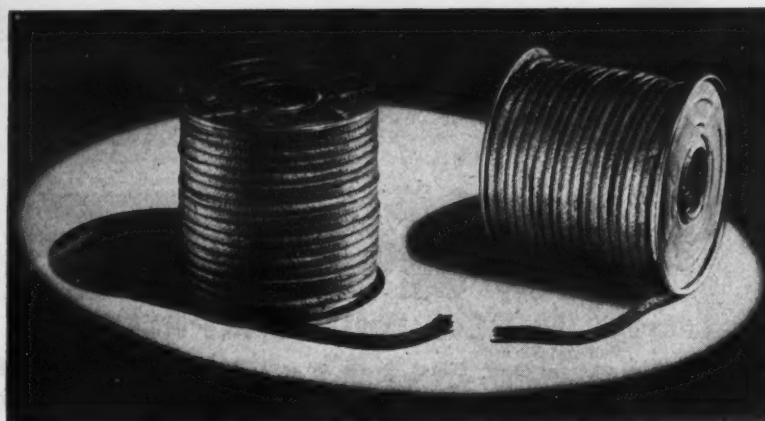
- More than twice as much light.
- Whitest, brightest light available from a flashlight battery.
- Half the cost for light output.
- Leakproof—no metal can to leak or corrode.
- Will not swell, stick or jam in a flashlight.



Why? Because of the exclusive "inside-out" construction of the "Eveready" No. 1050 battery. Instead of being the container for the cell, the zinc electrode is on the inside to make the battery last longer, while the new outside carbon jacket makes the battery leak-proof. Order a supply of No. 1050's today.

HEAT EXCHANGERS • PUMPS • VALVES • PIPING • TOWERS • TOWER PACKING • BUBBLE CAPS •  
BRICK • STRUCTURAL CARBON • SULPHURIC ACID CUTTERS • HYDROCHLORIC ACID ABSORBERS

When inquiring check CP 3165 on handy form, pgs. 2-3



# EXTRUDED TEFLON PACKING

## A Chemical-Proof Field Maintenance or Emergency Packing

For valves, pumps, agitators, autoclaves, couplings or any other stuffing box application, Chemiseal #620EG (impregnated with graphite) or #620EM (with mica) extruded Teflon packing is ideal for field maintenance or emergency use where it is impractical to have preformed packing rings made to order. Like all Teflon-"Chemiseal" products, #620EG or EM can't be attacked by any organic or inorganic acid, alkali or solvent. #620 is serviceable from -150° F. to 550° F.

"Chemiseal" extruded Teflon packing differs from other shredded oriented Teflon packings in that no synthetic or rubber binders are used in its fabrication—such additives tend to harden and render the packing unserviceable. Lubrication of the packing is enhanced by use of a highly acid-refined, non-nitridable hydrocarbon which, while soluble in common solvents, is unaffected by aqueous solutions of inorganic acids or alkalis. However, Chemiseal #620 is definitely recommended for solvent applications as the lubricant is not essential for anti-friction purposes.

#620 Packing is supplied in coil form, in a loosely-woven cotton jacket. It is sold by the foot and is available in rectangular cross-section from 1/4" up by 1/16" increments. Send for Catalog Nos. 620EG and 620EM.

## UNITED STATES GASKET CO.

618 N. 10th Street • CAMDEN, NEW JERSEY

When inquiring check CP 3166 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

**Improve forced draft fans  
by unique blade, wheel  
and casing design . . .**

speeds conversion of kinetic energy to static pressure desired

**Uses:** Suited to requirements of low, medium and high pressures, up to 40" W. G.

**Features:** Double inlet fans use two discs, with considerable space between to provide four angles of diffusion instead of two. This is an improvement over the "double wheel" with a common center disc. Air leaving the periphery of each wheel is permitted to diffuse laterally in each direction as it leaves the blading. This improved diffusion results in the conversion of a greater amount of velocity pressure to the desired static pressure, and more uniform distribution of air is effected throughout the scroll.

There is no heavy concentration of air at the center such as may be encountered with the double wheel with a common center disc. Wheels are of welded construction and both statically and dynamically balanced. Self-aligning, anti-friction type bearings are furnished as standard.

**Description:** Blades are of precisely developed backward curved design and are of heavy welded construction. Blade design permits a more nearly perfect aerodynamic flow across the leading and trailing surfaces. Operating noise is greatly reduced.

Oversize housings provide a greater diffusion of air leaving wheel, thereby aiding in conversion from velocity pressure to static pressure. Deep inlet cones aid in the smooth flow of air to the fan blades. For larger fans, the welded steel plate housings are split to permit access to wheel or for its removal. Gaskets are supplied for split housing joints. Inspection doors are furnished as required.

These double wheel fans are distinguished from conventional types by a space between the wheels large enough to permit four angles of diffusion instead of two.

Fans and related components are available for wide variety of installations in single or double inlet, single or double width for all angles of discharge.

**Source:** Designers and manufacturers: Prat-Daniel Corp., East Port Chester, Conn. Send all inquiries to The Thermix Corp., Project Engineers, Greenwich, Conn. . . . or for more information check CP 3167 on handy form, pages 2 and 3.

**5 built-in  
advantages found  
only in . . .**

## BLAW-KNOX Electroforged STEEL GRATING

BLAW-KNOX DIVISION  
OF BLAW-KNOX COMPANY  
2076 Farmers Bank Bldg.,  
Pittsburgh 22, Pa.  
Offices in Principal Cities

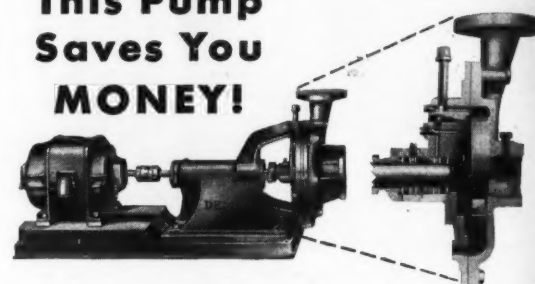
- 1 Rigid one-piece construction—easy to install.
- 2 Maximum open area for light and air.
- 3 Easy to paint—all surfaces accessible.
- 4 Non-slip Twisted Cross-Bar.
- 5 Self-cleaning—no sharp corners to clog.

*Blaw-Knox Grating Has Them All!*

**WRITE FOR BULLETIN 2365**

When inquiring check CP 3168 on handy form, pgs. 2-3

## This Pump Saves You MONEY!



### Note the Separate Liquid End

● Design of Deming Figure 4012 Side Suction, Two Ball Bearing Centrifugal Pumps permits making only the separate liquid end of special alloys for pumping corrosive liquids. Support head can be made of cast iron construction. This feature saves you money on first cost and on future repairs.

These pumps are made in sizes from 1" to 10" discharge with capacities from 10 to 3600 gallons per minute.

Performance tables and full description of Deming Figure 4012 Centrifugal Pumps are included in illustrated BULLETIN NO. 4012-A. Send for a copy.

**THE DEMING COMPANY**  
522 Broadway • Salem, Ohio, U. S. A.



When inquiring check CP 3169 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## PROCESSING EQUIPMENT

### 350 tons capacity reported for refrigerant condenser in field tests . . .

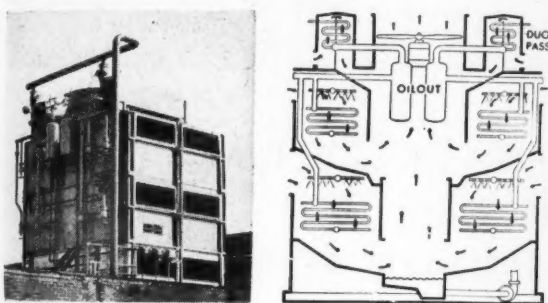
employs unique pre-cooling coils and oil separator

**Uses:** Condenser is recommended for application to refrigeration plants above 400 tons refrigeration capacity. Here, multiple units are generally installed, offering operating economies by allowing condensing capacity to be varied with actual refrigeration load. Nominal rating of the unit is 300 tons, and approximately 350 tons capacity is reported in field tests.

**Features:** Uses maker's "Duo-Pass" pre-cooling coil and "Oilout" oil separator, also employed in his smaller units.

**Description:** As shown in the accompanying diagram, the refrigerant gas first passes through the pre-cooling coils which are located on the top of the structure. These coils remove the superheat and reduce gas temperature close to its condensing point. Coils also condense entrained oil vapors, providing an ideal point for easily removing oil from the system by the "Oilout" separator drums which are next in line.

Gas then passes to the condensing coils where it is condensed by the effect of evaporation of a water spray. Approximately 1000 Btu are removed for each pound of water evaporated. Since superheat has been removed



High-capacity condenser for refrigeration plants (left) and its flow diagram (right)

previously, there is little tendency for salts to precipitate and clog the condenser coil banks. Savings in water, space, piping, pumping, and power are reported for this condensing method, as compared with conventional methods. Spent spray water falls to a tank at the base of the structure from which it is recirculated by pump.

Air is drawn through the condenser by a propeller fan, entering through screened ports that are arranged so the proper amount of the air stream passes through two pre-cooling "Duo-Pass" coils and the four sprayed condensing coils. Exhaust air, containing a proportion of hot dry air from the pre-cooling coils, has its humidity lowered to prevent fog from being blown from the condenser.

Unit measures 14' long x 13' wide x 18' in height. Weight is approximately 20 tons, largest section weighing 4 tons. Complete unit can be assembled on the job in 2½ days. Can be installed on a roof or on the ground. When installed on a roof, the load is usually far less than with conventional atmospheric condensers, spray ponds, towers, etc.

**Source:** Niagara Blower Company, Dept. CP, 405 Lexington Ave., New York, N. Y. . . . or for more information check CP 3170 on handy form, pages 2 and 3.

# where are your \$ \$ \$'s?

in the liquid phase, or  
in the solids phase of the slurry?

The Sharples Super-D-Canter is a centrifuge developing high centrifugal force (2100 x g) which makes it possible continuously to:

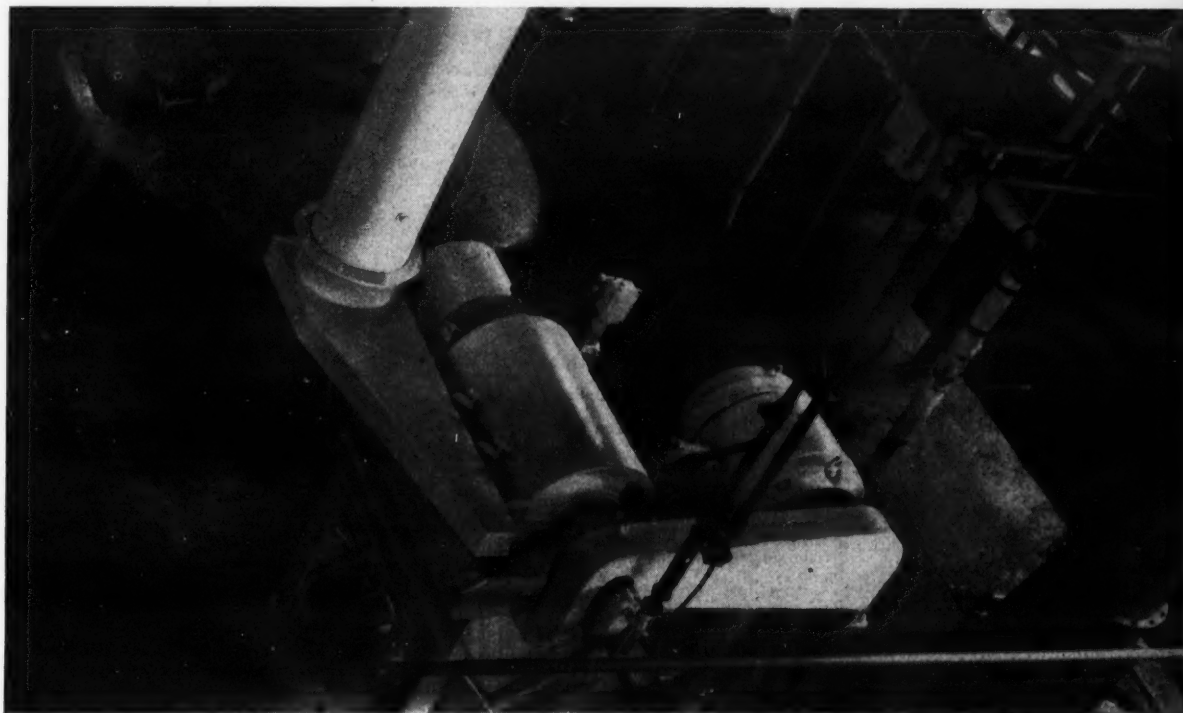
1. Recover and dewater crystalline type solids
2. Remove amorphous solids from suspensions
3. Classify solids by particle size
4. Clarify liquids
5. Rough out prior to final clarification or separation

In the typical installation below, the Super-D-Canter

efficiently removes undesirable solids from the valuable liquid, with minimum loss of mother liquor. In many other cases valuable solids are removed from useless liquids; or, both usable solids and liquids are separated.

Slurries containing from 1% to 20% or more solids can be handled by the Super-D-Canter, with solid particles from ½" down to several microns in size. Both solids and liquids are discharged continuously.

The Super-D-Canter is doing a big job around the world. Get the facts in Bulletin 1254.



Super-D-Canter in chemical processing at Hooker Electrochemical Company, Niagara Falls, N. Y.

# SHARPLES

THE SHARPLES CORPORATION • 2300 WESTMORELAND STREET, PHILADELPHIA 40, PENNA.  
NEW YORK • BOSTON • PITTSBURGH • CLEVELAND • DETROIT • CHICAGO • NEW ORLEANS • SEATTLE • LOS ANGELES • SAN FRANCISCO • HOUSTON

When inquiring check CP 3171 on handy form, pgs. 2-3

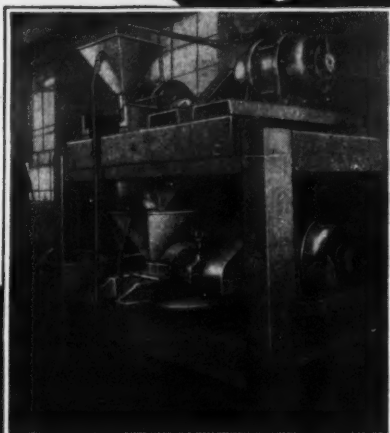
# SAVED

93% IN POWER

84% IN TIME

with the

## MIKRO PULVERIZER



Two pass Wet Milling MIKRO PULVERIZER installation grinding clay-graphite and colored sludges for a pencil manufacturer.

Leading manufacturers of pencils and crayons have applied the Wet Milling MIKRO-PULVERIZER to grinding their clay-graphite and color sludges. It had been previous practice to ball mill this sludge.

In one plant the former procedure had been to run a batch of about 150 gallons in ball mills requiring a total of 25 h.p. for a period of more than 50 hours. The same finished product is produced in a Wet Milling MIKRO-PULVERIZER in 8 hrs. using 10 h.p.—1250 h.p. hrs. compared to 80 h.p. hrs.

The Wet Milling MIKRO-PULVERIZER has found a considerable use in the food products field, color and dyestuff industry, as well as for pharmaceutical ointments and the chemical, clay, cosmetic and insecticide industries. It is equally successful on both pastes and slurries. For grinding solids in suspension, or subjecting the material to an intensive mixing action—the MIKRO generally will do either, and do it better with less power.

Also available for Dry Milling, our full line of MIKRO-PULVERIZERS and MIKRO-ATOMIZERS noted for thorough blending and precise particle control... grinds from granular to ultra-fine in lower micron range... capacities from 75 to 25,000 lbs. per hour. For complete recovery of solids and elimination of industrial dusts, investigate our MIKRO-COLLECTOR.

SEND FOR — New Illustrated MIKRO Catalog

**PULVERIZING MACHINERY COMPANY**  
60 Chatham Road Summit, N. J.

# MIKRO-PULVERIZER

Reg. U. S. Pat. Off.

# MIKRO-ATOMIZER

Also Makers of the MIKRO-COLLECTOR

PRESERVE OUR HERITAGE: FAITH, FREEDOM AND INCENTIVE.

When inquiring check CP 3172 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

**Almost no product leakage from granulator...**

screen is held firmly in place against seat by clamps

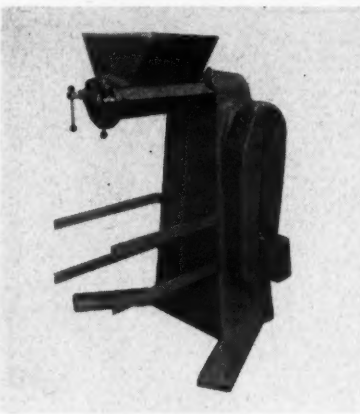
**Uses:** Oscillating granulator for size reduction operations.

**Features:** Leakage of material is practically eliminated. Screen seat has been extended to prevent material from working around its ends, and screen is held firmly in place by clamps.

**Description:** Entire drive mechanism (including worm, worm gear, crank, segment, and pinion) is completely sealed in oil, extending normal life of these parts and giving smooth, quiet operation.

Protection for motor against dust and dirt is accomplished by mounting the motor within generator housing, with only the end exposed for ventilation. Rotor and shaft are splined together, and rotor is completely polished inside and out.

All pockets and points where dust can collect have been eliminated. Hopper has smooth inside finish for easy cleaning; bottom of hopper has



Oscillating granulator

provision for adding a tight-fitting discharge chute with quick-acting toggle clamps.

**Source:** Model 43B oscillating granulator is made by F. J. Stokes Machine Company, Dept. CP, 5900 Tabor Rd., Philadelphia 20, Pa. For more information check CP 3173 on handy form, pages 2 and 3.

### Power supply units

Illustrated data sheets on single and dual voltage regulated power supply units are issued by Kepco Laboratories, Inc., Dept. CP, 149-14 41st Ave., Flushing, N. Y. When inquiring specify CP 3174 on handy form, pages 2 and 3.

# Now you can SPRAY DRY in laboratory or pilot plant quantities



The Swenson Research Spray Dryer provides instant drying at low temperature, with close control of moisture in the finished product. Ideal for use in developing new products and new processes. Write for Bul.D-106.

**SWENSON EVAPORATOR CO.**

Division of Whiting Corporation

15667 Lathrop Ave.

Harvey, Illinois

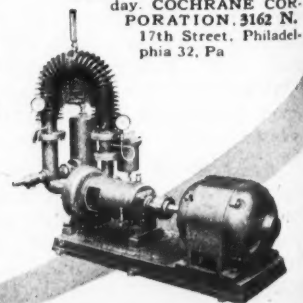
When inquiring check CP 3175 on handy form, pgs. 2-3

## FAST, UNIFORM HEAT NO FLASH LOSS CONDENSATE RETURNED TO BOILERS AT HIGH TEMPERATURE AND HIGH PRESSURE

These results are obtainable through the installation of the Cochrane C-B System, a completely closed circuit, with a jet pump and a centrifugal pump incorporated in one, draining hot condensate from steam process equipment and returning it to the boiler at close-to-process temperature and at high pressure.

Savings in fuel, increase in production, improved quality are all immediately obtainable with the installation of the C-B System.

Cochrane Publication 3250 gives complete information on the C-B System. Write for your copy today. COCHRANE CORPORATION, 3162 N. 17th Street, Philadelphia 32, Pa.



COCHRANE

# CB

## SYSTEM

OF CONDENSATE DRAINAGE CONTROL

When inquiring check CP 3176 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## PROCESSING EQUIPMENT

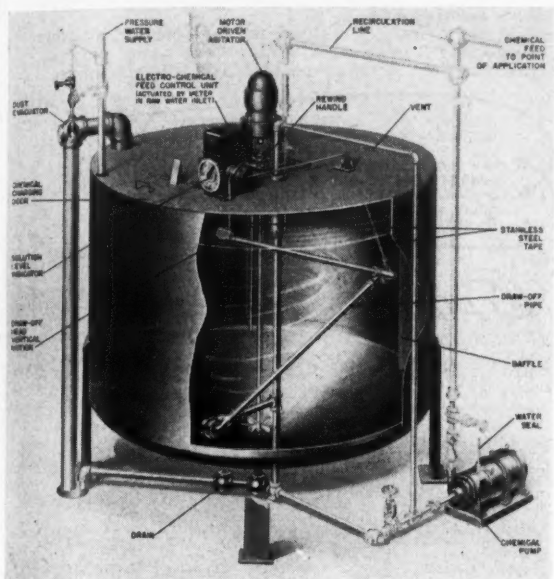
### Proportions chemical solution to raw water that's due for softening . . .

feeding rate of rugged device can be easily varied; has no small orifices that can plug

**Uses:** For controlling the continuous and proportional flow of chemicals to a water softener.

**Features:** Ratio of chemical solution fed can be easily varied by manual adjustment of knob on dial of time switch. There are no small measuring orifices which might become fouled. Unit is rugged.

**Description:** Method of operation is apparent by study of the drawing. Water flows through an integrating raw water meter. The integrator makes an electrical contact



Cut-away drawing of chemical solution feeding apparatus reveals operational principle and component parts

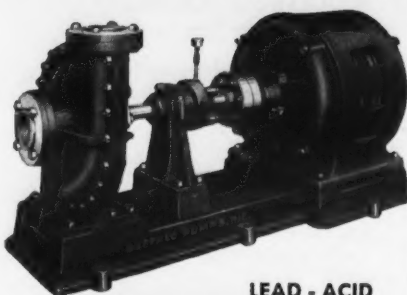
when a predetermined quantity of water has passed through the meter, thus starting the control unit and time switch which limits the operating time of the control unit. The solution draw-off head travels vertically downward at the rate set by the control unit. Quantity of solution fed is always proportional to the flow of water.

A water-operated evacuator (top left) removes the dust from chemical tank during charging of the tank with treating chemicals. This prevents escaping of the dust to the atmosphere.

**Source:** The Electro-Chemical solution feeder is a product of The Permutit Company, Dept. CP, 330 W. 42nd St., New York 18, N. Y. . . . or for more information check CP 3177 on handy form, pages 2 and 3.

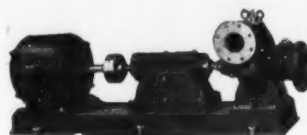
### Reviews high polymers

Revised in 1950, 891-page book gives systematic account of the entire field of natural and synthetic inorganic and organic high polymers. Contents include both theoretical and practical aspects. To obtain "Natural and Synthetic High Polymers", 2nd edition, remit \$15 direct to Interscience Publishers, Inc., Dept. CP, 250 Fifth Ave., New York 1, N. Y. When inquiring specify CP 3178 on handy form, pages 2 and 3.



**LEAD-ACID AND OTHER CHEMICAL PUMPS**

"Buffalo" Chemical Pumps are available with lead lining like the pump shown, or rubber lined or of special alloys. Bulletin 982.



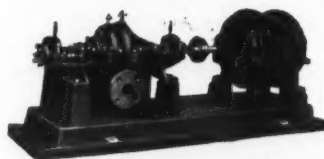
**PAPER STOCK PUMPS**

Diagonally-split-shell non-clogging pumps. A design for every liquid, every consistency, all proven in paper and pulp mills. Bulletin 953-F.



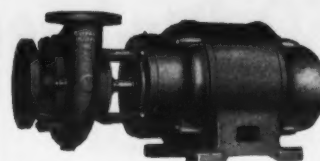
**SUMP PUMPS**

Self-contained vertical units ready to install. Rugged, trouble-free, with ball-bearing thrust and enclosed shaft. Bulletin 963-F.



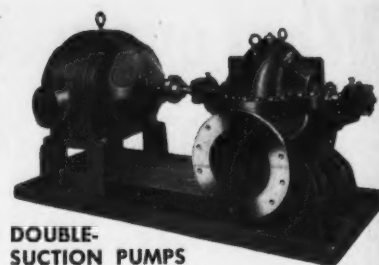
**TYPE "RR" PUMPS**

For handling clear water, any temperature, at high pressures. Widely used for boiler feed. Rugged, efficient. Bulletin 980-B.



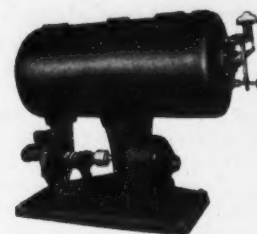
**CLOSE-COUPLED PUMPS**

A real space-saving design with no sacrifice in durability and efficiency. For clear water, but can be had in special alloys. Bulletin 975-B.



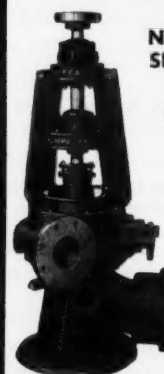
**DOUBLE-SUCTION PUMPS**

For top performance on clear water jobs, including air washers, these are of the finest materials and construction. Bulletin 955-N.



**AUTOMATIC CONDENSATE PUMPS AND RECEIVERS**

Will handle condensate at 212°F. without being affected in any way. Self-priming and trouble proof. Bulletin 960-G.



**NON-CLOGGING SEWAGE PUMPS**

Vertical and horizontal models for trouble-free operation in sludge circulation, agitation and removal, in lift stations and treatment plants. Bulletin 964-D.

## "Buffalo" PUMPS MEAN MONEY SAVED THROUGH TROUBLE AVOIDED

True economy in pumping is in the pump you can install — and practically forget! "Buffalo" has always built such pumps. First cost may be a few dollars more than the "low-bidder" pump, but careful, sound "Buffalo" design and construction has always paid for itself in (1) longer years on the job, (2) fewer and shorter shutdowns, and (3) high efficiency.

As the pictures on this page show, you can pick a "Buffalo" Centrifugal Pump that's tailor-made for just about any liquid job you have. WRITE FOR BULLETINS!

### BUFFALO PUMPS, INC.

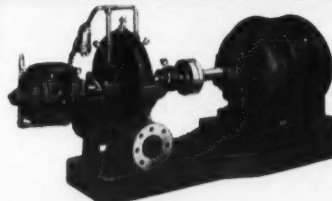
524 BROADWAY BUFFALO, N. Y.  
Canada Pumps Ltd., Kitchener, Ont.  
Branch Offices in all Principal Cities

### — And For FANS . . .

. . . you'll find a full line of centrifugal, axial flow and propeller fans in the sizes and arrangements you want — a fan for every job! For best results on your next fan installation, look to "Buffalo". . . First For Fans. For complete information, write:

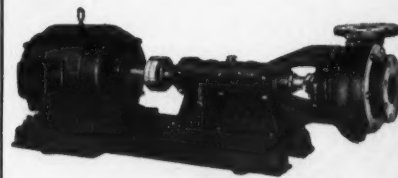
### BUFFALO FORGE COMPANY

524 BROADWAY BUFFALO, N. Y.  
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.  
Branch Offices in all Principal Cities



**SELF-PRIMING PUMPS**

Positive prime is maintained at all times. A popular feature available in all "Buffalo" Double Suction Pumps. Bulletin 970-A.



**SPECIAL ALLOY PUMPS**

Single suction, full ball bearing pumps, suitable for construction in most machineable alloys. Bulletin 982.

When inquiring check CP 3179 on handy form, pgs. 2-3

## Page 104

## PROCESSING EQUIPMENT

### Mix contents of containers on electric shaker . . .

unit with 1/3 hp motor blends wet or dry ingredients, adjusts easily to container

**Uses:** For mixing either wet or dry ingredients.

**Features:** Shakes and mixes at the same time. Adjustable for handling metal or glass containers from a quarter pint to a full gallon.

**Description:** Mixer is delivered fully equipped, ready to be plugged into any outlet. Heavy-duty V-belt drive is controlled by automatic spring take-up to prevent slippage.



Mixer-shaker handles containers 1/4 pt-1 gal

No adjustments are required. Inner oscillating shafts are of special Mechanite steel set in self-lubricating bearings. Chassis and clamp bearings are heavy-duty aluminum. Net weight is 75 lb. Motor is 1/3 hp, 115/230 v, 60 c.

**Source:** Whirlwind mixer is built by Holt Mfg. Co., 651 20th St., Oakland 12, Calif. . . or for more information check CP 3185 on handy form, pages 2 and 3.

### "Color blind" infrared radiated from heaters

Four-page form gives many details about radiant heaters that emit far infrared rays absorbed at almost equal speed by all colors. Heaters have applications in baking, drying, pre-heating, dehydrating, degreasing, etc., and are especially useful on multi-colored and light-colored objects. Units measure only 2" high; degree of heat is variable through input control. Quick warm-up, uniform heating pattern, and lack of glare are other significant features.

Form contains many photographs of this equipment actually at work on various applications, and suggests a number of other uses. Form F 1523 is issued by Edwin L. Wiegand Company, Dept. CP, 7500 Thomas Blvd., Pittsburgh 8, Pa. When inquiring specify CP 3186 on handy form, pages 2 and 3.

## SEND FOR THIS 32 PAGE MULTICLONE BOOKLET

**HELPFUL-INFORMATIVE IT OUTLINES THEORIES AND BASIC PRINCIPLES OF CENTRIFUGAL DUST RECOVERY!**

Or, for special side of pressure can same Multiclone can even outlet:

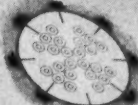


FIG. No. 15

Or, in still other shapes to fit specialized applications.

It is readily apparent that conventional cyclones with their complicated manifolds and the separate inlet and outlet ducts required for each collector, are far more restricted in their adaptability to space limitations.

A further space adaptability feature found in the Multiclone is the unusual flexibility of its inlet and outlet duct arrangements. Where headroom must be kept at a minimum, the Multiclone can be installed with side inlet and side outlet ducts, giving it an "in-line" installation that requires a minimum of vertical height.



FIG. No. 16

20

FIG. No. 17

allows horizontal installation when this feature

the more complicated duct work necessary with conventional cyclone units makes it more difficult to adapt to space limitations. Simple installation, but because the inlet duct is usually located below the outlet, necessitating much more complicated average equipment to collect dust from any one source (Fig. 18).



FIG. No. 18

21

**32 PAGES OF DIAGRAMS AND INFORMATION**

**This booklet shows...**

**MULTICLONE'S SPACE SAVINGS...** How the Multiclone requires less square footage, less cubic footage than most other equipment of comparable capacity and performance, thus saving costly plant space!

**MULTICLONE'S ADAPTABILITY...** How the Multiclone is more adaptable to varying inlet-outlet requirements — to varying space limitations — and is simpler to install, thus reducing installation costs!

**MULTICLONE'S EFFICIENCY...** How Multiclone's multiple small diameter tubes, made possible by its exclusive vane design, give higher centrifugal forces and more complete cleansing of all suspended particles — even small ones of 10 microns and less!

**MULTICLONE'S LOW MAINTENANCE...** How the Multiclone has no high speed moving parts to repair or replace, no pads or filters to clean or renew, nothing to choke gas flow or increase draft losses as suspended materials are recovered. Multiclone draft losses remain uniformly low — recovery efficiencies uniformly high — at all times!

**Make sure that a copy of this helpful booklet is in your reference files by sending for your copy now!**

**NO MATTER** whether you are now using mechanical dust recovery equipment or are planning the installation of such equipment at some future date, here is a booklet that is full of helpful and valuable information on centrifugal dust recovery. It not only explains the basic methods and principles involved, but also shows the important differences between small and large diameter separating tubes, shows how to simplify your duct work and reduce installation costs, and outlines many other important factors to be considered in selecting mechanical dust recovery equipment.

In addition, this informative booklet illustrates and explains how MULTICLONE's unique vane design is fundamentally different...how it makes possible greater compactness, simpler installation, high recovery of the small particles as well as the medium and coarser ones, and many other facts on MULTICLONE advanced design.

A limited supply of these booklets is available for free distribution to those interested in mechanical recovery equipment and methods. Write for your copy today.

**NOW SELLING...**

**COTTELL**  
Precipitators  
**MULTICLONE**  
Collectors  
**TURBULAIRE**  
Spray Dryers

**... in all parts of the U.S.A. and foreign countries.**

When inquiring check CP 3187 on handy form, pgs. 2-3

**WESTERN**  
**Precipitation**  
**CORPORATION**

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1023 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA  
CHRYSLER BLDG., NEW YORK 17 • 1 LaSALLE ST. BLDG., 1 N. LaSALLE ST.,  
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PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

## Long-Lasting Protection from Corrosion and Abrasion . . .



### For Metal Parts or Products

The fan impeller, pump, barometric leg, ribbon conveyor and float control regulator shown above are typical of the hundreds of different metal parts and products that have been given the long-lasting protection provided by Goodall Applied Coatings, against the destructive effects of corrosion and abrasion.

Goodall Coatings, of rubber or synthetic rubber compounds, can be applied to the exterior or interior surfaces of virtually any type of metal equipment, regardless of its size or shape . . . to give a complete, inseparably bonded cover that will withstand corrosive and abrasive actions for a period equal to many replacements of the unprotected metal product.

From the standpoint of metal conservation, and because of the impressive savings resulting from lower replacement costs, the application of "Allgood" Coatings may logically be considered in terms of investment, rather than expense.



Send for Illustrated Booklet



### GOODALL RUBBER COMPANY

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.  
Branches: Philadelphia • New York • Boston • Pittsburgh • Chicago • Detroit • St. Paul • Los Angeles  
San Francisco • Seattle • Portland • Salt Lake City • Denver • Houston • Distributors in Other Principal Cities

When inquiring check CP 3188 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

### Fabricate expansion joints from Teflon for heat and chemical resistance . . .

function under stress without cracking or bursting; designed for 25 lb pressure

**Uses:** For service where thermal expansion, vibration, misalignment, or other conditions demand a flexible, chemical-proof piping section.

**Features:** Tough, heat-resistant and impervious to chemical attack. Fabricated by a special process, these solid Teflon joints cannot be attacked by or contaminate any chemical used commercially.

**Description:** Available for all types of equipment and a wide variety of operating conditions. Joints are normally supplied with suitable integrally-gasketed flanges drilled to 150 lb ASME standard. Joints are designed for 25 lb pressure and are serviceable through temperature range -150 to 400°F.

**Source:** "Chemiseal" Teflon expansion joints are made by United States Gasket Co., Teflon Products Div., Dept. CP, Box 93, Camden, N. J. . . . or for more information check CP 3189 on handy form, pages 2 and 3.

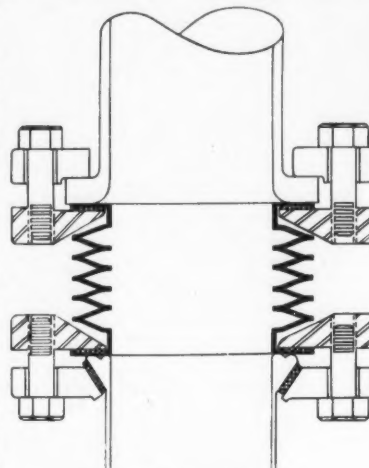
### Achieve exchanger economies by using corrosion resistant parts only where needed . . .

corrosion resistant joint made without welding to the inner tube, changing grain structure

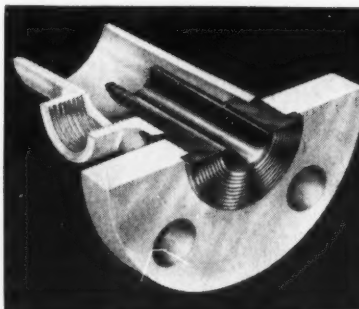
**Uses:** Heat exchangers for pressures to 900 psi and temperatures in excess of 700°F.

**Features:** Corrosion resistant materials are used only where required — as flange inserts and inner tube which contact the fluid or vapor being heated. Important is the fact that a corrosion resistant joint is made without welding; the alloy inner tube is expanded into prepared serrations in the ID of the insert flange by special torque limit tools which prevent undesirable stresses. A positive joint is formed without the application of heat which would change the grain structure of the alloy and thus lower corrosion resistance.

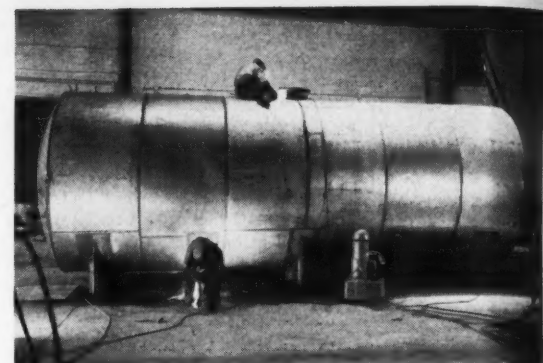
**Description:** Furnished in sizes from a fraction of a



Solid Teflon expansion joint



Exchanger flange insert



## BRIGHTON HANDLES BIG JOBS

with the same skill, workmanship  
and attention to detail that has  
made this company world famous.

This solid stainless steel formaldehyde storage tank is an example of a big job (9½' diameter by 24' length) that was built to customers specifications. It was shipped complete — ready to install.

See Brighton for Portable Kettles or Trucks. Write today for new catalog No. 12.

## BRIGHTON COPPER WORKS, INC.

BRIGHTON STATION — CINCINNATI 14, OHIO Est. 1914

When inquiring check CP 3190 on handy form, pgs. 2-3

## BIN-LEVEL CONTROLS

2 BIN-DICATORS  
Often Replace 1 Man



**BIN-FLO**  
Aerating Units Keep  
Finely-Ground  
Materials  
Moving

ECONOMICAL  
MATERIAL  
CONTROL

DEPENDABLE  
BIN-LEVEL  
INDICATION

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THE BIN-DICATOR CO., 13946 Kercheval, Detroit 15, Mich.

Please send new 20-page catalog giving complete information and specifications on BIN-DICATORS. Also please send information on BIN-FLO Aerating Units.

CP-1

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Address \_\_\_\_\_

City \_\_\_\_\_

Zone \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 3191 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

square foot of heating surface to several hundred square feet in lengths up to 30' per segment. Internal tube sizes range from 1/4 to 4". Exchanger provides uniform heat over the full surface from flange to flange without dead spots. Space is saved because it forms an integral part of the piping system. It can be supported along a wall, or on hangers. Used singly or in groups, the exchangers are easily demounted for cleaning, and it is a simple matter to add additional capacity as needed.

**Source:** Econalloy heat exchangers are built by Martin-Quaid Co., Dept. CP, Philadelphia 32, Pa. . . or for more information check CP 3192 on handy form, pages 2 and 3.

### Less than one quarter turn reported to separate quick coupling . . .

quick action due to construction, consisting of lugs and mating tail piece or hose spud

**Uses:** Two-piece, self-positioning quick coupling for fluid and gas lines.

**Features:** Manufacturer reports that coupling can be opened or closed with less than a quarter turn, and in less than 1 second.

**Description:** Coupling consists of a body with 3 tapered locking lugs and mating male or female tail piece or hose spud. It is available in sizes from 1/2 to 6", of aluminum, bronze, stainless steel, or Ni-Risist. Two pressure styles are made, one for 150 psig, the other for pressures "in excess of 2000 psig".

Matching taper on the handle ring locking lugs and tail piece locking flanges tends to add resistance to shock and vibration. Gasket wear is minimized because the flat

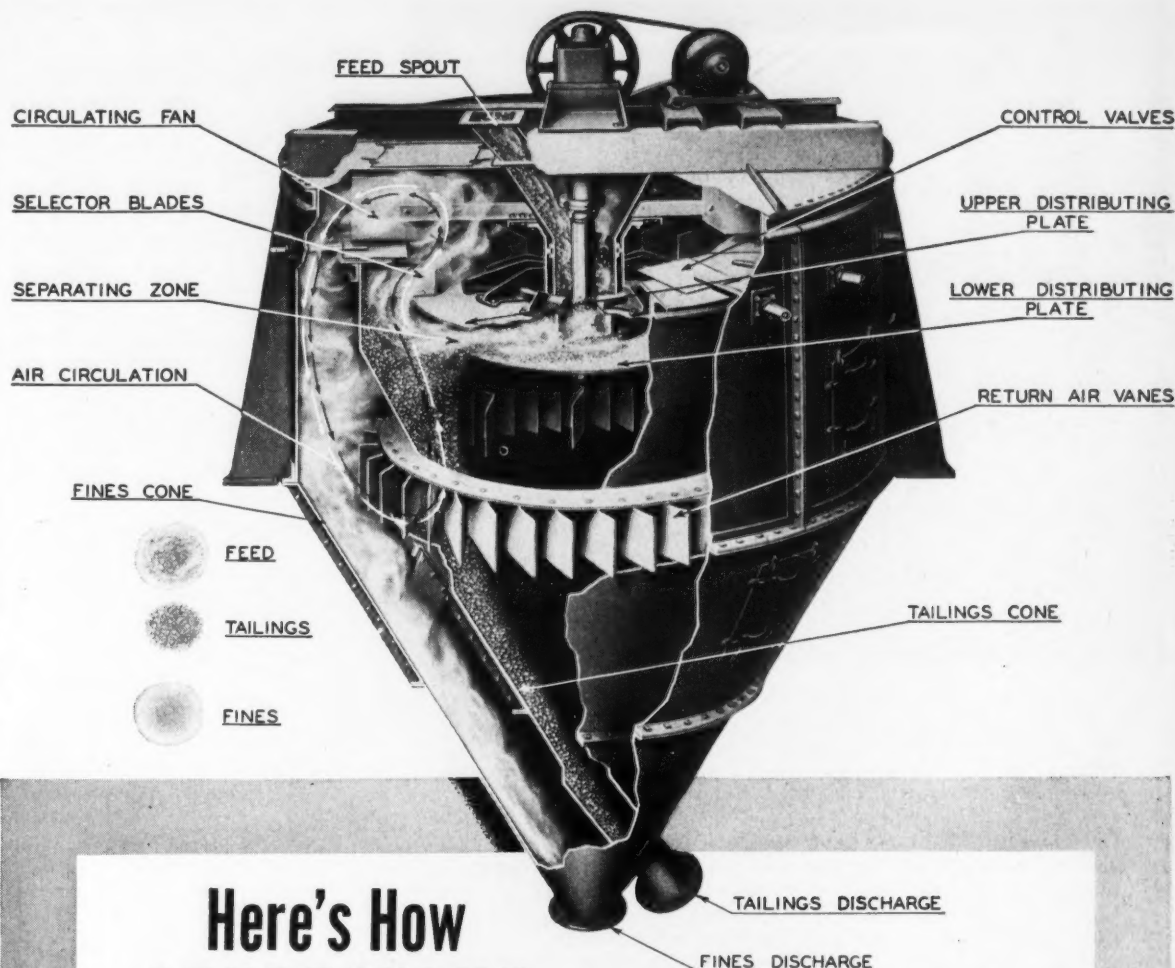


Coupling ranges in sizes from 1/2 to 6 inches

tail piece face is pressed straight against the gasket without twisting action, and is locked to the gasket under pressure when the connection is made. Gasket is held in place at all times through use of an undercut in the body.

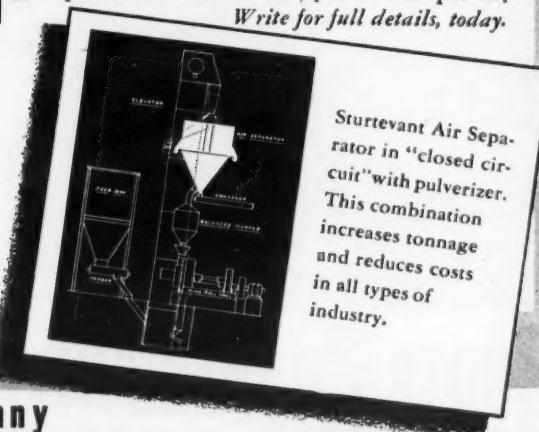
Reports indicate that long, leak-proof service life is obtained due to the metal-to-metal locking arrangement of lugs and flanges. There are no exposed threads on coupling to become damaged, and the gasket is protected at all times. Tail piece caps and body caps are available to protect lines from contamination when uncoupled.

**Source:** J. S. quick coupling is manufactured by The Mead Cornell & Company, Dept. CP, P.O. Box 2682, Cleveland 7, O. . . or for more information check CP 3193 on handy form, pages 2 and 3.



## Here's How STURTEVANT Air Separators Increase Production of Fines... Lower Separation Costs

- Sturtevant Air Separators effect production savings by increasing output by 25 to 300% . . . reducing power consumption by as much as 50%.
  - They efficiently carry off all classified materials in any desired fineness from 40 to 325 mesh and finer . . . eliminate the need of screening in certain applications.
  - Capacities available from 1/4 to 50 tons per hr.
- Write for full details, today.*

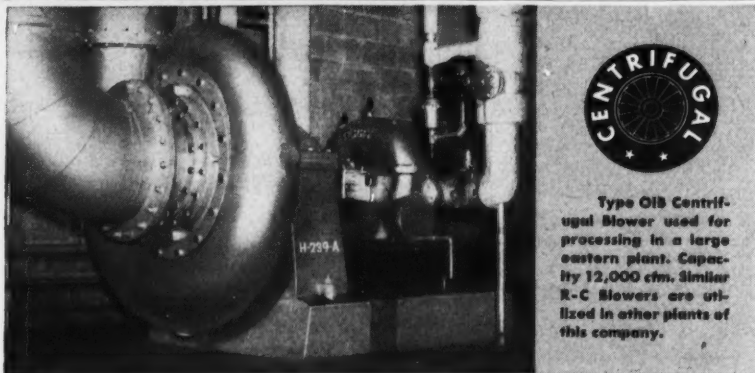


### Sturtevant Mill Company

119 Clayton Street, Boston 22, Mass.

Designers and Manufacturers of: CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS • MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS

When inquiring check CP 3194 on handy form, pgs. 2-3



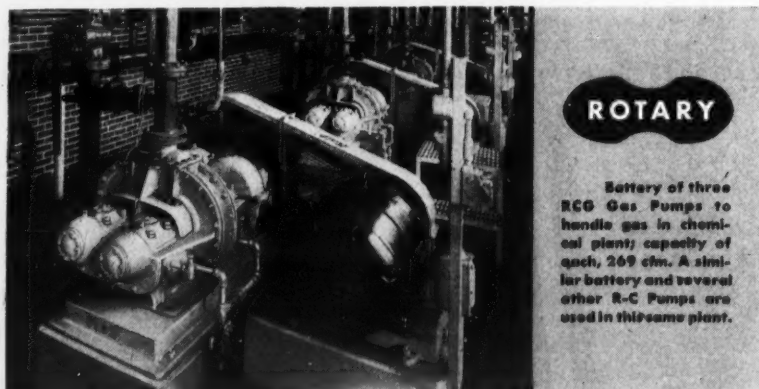
Type OIB Centrifugal Blower used for processing in a large eastern plant. Capacity 12,000 cfm. Similar R-C Blowers are utilized in other plants of this company.

The works manager of a large plant made this friendly statement to a Roots-Connorsville representative. What he really meant was that R-C Blowers and related equipment perform so satisfactorily and dependably that they seldom need anything more than routine inspection by his own men.

In large and small plants, in every industry, R-C products uniformly give this kind of reliable operation. They continue to deliver rated capacities, year after year, with a minimum of maintenance—whether a small Rotary Positive Blower of 5 cfm capacity or a Centrifugal unit moving up to 100,000 cfm. And remember, only Roots-Connorsville gives you this important dual-choice.

If you are planning a new plant, expansion, or replacements, R-C engineers will work with you to select the equipment best fitted to your needs. Almost a century of experience is at your service.

ROOTS-CONNORSVILLE BLOWER CORPORATION  
510 Richland Avenue, Connorsville, Indiana



Battery of three RCG Gas Pumps to handle gas in chemical plants; capacity of each, 269 cfm. A similar battery and several other R-C Pumps are used in this same plant.

**ROOTS-CONNORSVILLE**  
ONE OF THE DRESSER INDUSTRIES

When inquiring check CP 3195 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

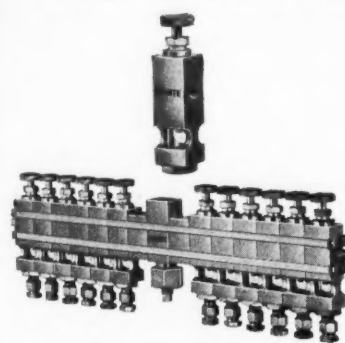
### Supplements line of sight-feed valves . . .

single and gang mounting styles for oiling systems

**Uses:** Angle-type, sight-feed valves for pressure or gravity oiling systems. Permit constructing own oiling system. Styles for single or gang mounting.

**Features:** Extremely free-flow characteristics are reported. Flow of oil can be visually checked and closely regulated. Supplements to previously announced Style SFN.

**Description:** Valves are furnished in three body sizes having female inlets ranging from  $\frac{1}{8}$  to  $\frac{1}{4}$ ", and



Style SFM Model B-211 gang-mounted sight feed valve has female pipe thread inlet and compression fittings for  $\frac{1}{4}$ " tubing

female outlets from  $\frac{1}{8}$  to  $\frac{1}{2}$ ". Plastic or glass sight glasses are available. Friction screw offers hairline adjustment from full flow to tight shut-off.

Single valves are designated as Style SFG, and multiple as Style SFM. Gangs of the latter can replace as many as 2 to 24 conventional oilers for bearings, etc. In addition, they provide a centralized lubrication method for hard-to-get-at places.

**Source:** Products of the Oil-Rite Corporation, Dept. CP, 3461 South 13th St., Milwaukee 15, Wis. . . . or for more information check CP 3196 on handy form, pages 2 and 3.

### Preheat feed water in small power plants

Two-page, 2-color bulletin describes water heaters for preheating boiler feed water in power plants of 300 hp or less.

Illustrated with photographs, cutaway view, and dimensional diagrams, Bulletin S-201-A is issued by The Swartwout Company, Dept. CP 18511 Euclid Ave., Cleveland 12, O. When inquiring specify CP 3197 on handy form, pages 2 and 3.

## DURA-TRED FLOORS TAKE IT!



**RENEW Beat-Up Old Floors** for efficient operation inside or out. Dura-Tred quickly solves your problem on wood block, wood plank, concrete or metal. Lay it on a square foot a minute—start using it right away. Repair holes and rough spots on ramps, runways, truck beds, etc. We last years under any weights the under flooring will stand. See Dura-Tred floors that have taken years of rough traffic; we'll tell you of the Dura-Tred floors near you. Write us.

Dura-Tred's  
**"QUICK-FLOOR"**  
over metal, concrete

Dura-Tred's  
**"OVER WOOD PLASTIC"**  
over wood floors

### • DURA-TRED COMPANY •

The Original Floor Patcher and Surfer Since 1938  
Room 210, 357 N. Central Park Blvd. Chicago 24, Ill.

When inquiring check CP 3198 on handy form, pgs. 2-3

**1000 GALLONS  
DEIONIZED WATER 18c\***  
(equivalent to distilled water)  
\*Based on 10 grain water

A truly revolutionary development—the single tank Elgin MonoFlo Deionizer that brings the cost of high quality demineralized water within the range of those who have heretofore found evaporated or distilled water prohibitive in cost. Here is the perfect process water and feedwater treating equipment.

The single column Elgin Deionizer produces water of higher quality than delivered by two and four-column demineralizers. In fact, for nearly all purposes, the water is freer from impurities than distilled water—and at a fraction of the cost. Naturally the compact Elgin MonoFlo Deionizer costs far less to buy and operate. It requires but little space—is simple in operation—cuts regeneration time and rinse water requirements—and has other notable Elgin features which makes it today's outstanding deionizing equipment.

Write today for complete data

**ELGIN SOFTENER CORPORATION**

180 N. Grove Avenue, Elgin, Illinois

WATER CONDITIONING FOR EVERY NEED

When inquiring check CP 3199 on handy form, pgs. 2-3

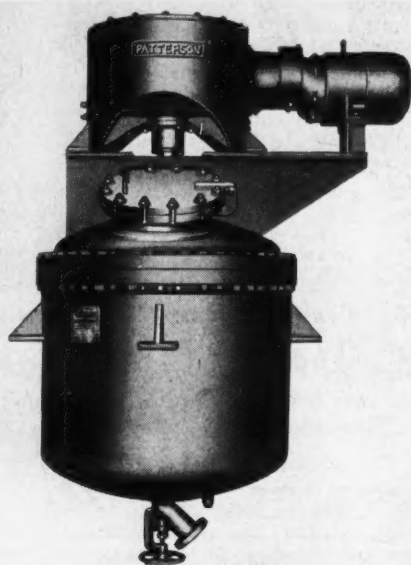
## PROCESSING EQUIPMENT

### Soap crutcher is built for heavy duty . . .

is applied to processing of all kinds of soaps and manufacture of other specialties

**Uses:** Processing of toilet, laundry and hand soaps. Also useful in manufacture of metallic soaps, rust-prevention compounds, and other specialties of this type.

**Features:** Scraper type mixing equipment in the unit assures high rate of heat transfer. Built in a range of sizes



Heavy-duty soap crutcher

from which selection for practically any desired capacity can be made.

**Description:** Heavy-duty soap crutcher is jacketed over the bottom and over 93% of the sides for 125 psi steam. Unit illustrated has total capacity of 248 gal. It is 42" in diameter by 36" high on the straight side. All crutchers are supplied with fully enclosed drive and oil bath lubrication.

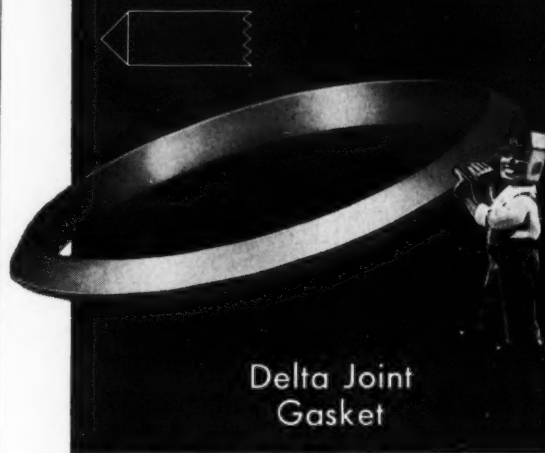
**Source:** Made by The Patterson Foundry & Machine Company, Dept. CP, East Liverpool, Ohio . . . or for more information check CP 3200 on handy form, pages 2 and 3.

### Presents various items of pipe and tubing

Sixteen-page pipe and tubing bulletin shows various types designed to convey acids, alkalis, and miscellaneous chemicals. Products fall roughly into 5 basic classes: rubber-lined, wood, and wood-lined pipe; and monel and stainless steel tubing. Much essential data is given on performance, fabrication, and applications.

Contents include tables showing what industries are served by each style of pipe and tubing, what products are carried by each style, and nominal sizes of each. Brief descriptions tell just how each product is used in various industries. Products are illustrated by installation and factory photographs. Pipe and tubing bulletin is issued by Michigan Pipe Company, Dept. CP, Bay City, Mich. When inquiring specify CP 3201 on handy form, pages 2 and 3.

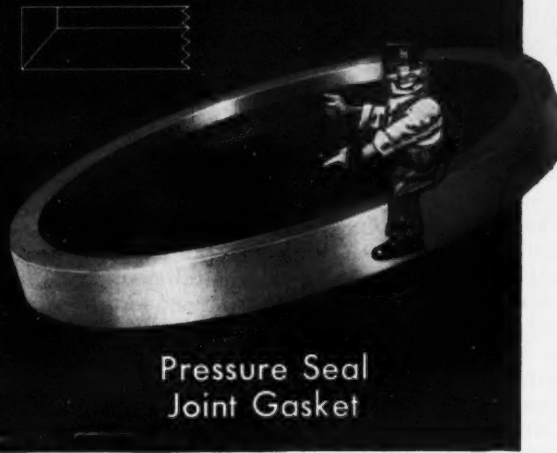
# Need special high pressure gaskets such as these?



Delta Joint  
Gasket



Flare-type Gasket  
with Bellows Action



Pressure Seal  
Joint Gasket

## We tailor them to your specifications

If you require high pressure gaskets made to extremely close tolerances—for service exceeding 10,000 psi, for example—and fabricated to any desired diameter or cross-section, why not look into the special service that Goetze offers for making these gaskets to your order.

The gaskets shown above are typical of the wide variety for high pressure service that have been made to order for Goetze customers. The flare type gasket with bellows action illustrated at upper right is but one example of what Goetze "know-how" can accomplish.

Goetze has had over sixty years of experience in making specialized metallic gaskets for industry's most complex jobs. Modern machines—many of them specially designed and built by Goetze—enable Goetze craftsmen to produce gaskets of any required design, shape or size . . . and deliver them with remarkable promptness.

For further information about Johns-Manville Goetze gaskets, write for a copy of the new Goetze Gasket Catalog. Or send us a drawing or template for assistance on your specific problem. Address Johns-Manville, Box 290, New York 16, N. Y.



# Johns-Manville Goetze GASKETS

THERE'S A JOHNS-MANVILLE PACKING  
AND GASKET FOR EVERY SERVICE.

When inquiring check CP 3202 on handy form, pgs. 2-3

# O.D.S. DIAPHRAGM PUMP

**Low Maintenance —**

**an Outstanding Feature**



We are announcing a 4 inch pump to add to the ODS line. This 4 inch ODS, like the others, is for handling slurries and, in some cases, clear or cloudy solutions. It's a simple pump, its simplicity largely accounting for its exceptionally low maintenance.

The key to this ODS low maintenance is in the diaphragm, its assembly and its operation. The diaphragm is a plain piece of special rubber with no holes, slots or punchings. It is actuated solely by air or gas under pressure or vacuum. There is no mechanical linkage and, of course, no stuffing box. Valves are either ball check or flap type, depending upon the kind, size and shape of solids in the slurries. All standard contact parts are rubber or rubber-lined, although where slurries or solutions are definitely non-corroding, unlined parts are available.

Several sizes of ODS pumps are available, ranging from 1½ to 4 inches with capacities based on water up to 100 gpm against a 200 foot head. Bulletin 309 gives full details. In writing for your copy, tell us about your problem.

For handling clear chemical solutions, hot and cold, we also have the Olivite Acid-Handling Pump, a centrifugal pump. It is available in three sizes, 1½, 2 and 4 inch.

## OLIVER UNITED FILTERS Inc.

New York 18 — 33 W. 42nd St.  
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San Francisco 11 — 260 Calif. St.

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Factories: Hazleton, Pa. • Oakland, Calif.

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Dorr-Oliver Co., Ltd., London, S.W. 1  
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HAWAIIAN ISLANDS  
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PHILIPPINE ISLANDS  
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WEST INDIES  
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Melbourne

SOUTH AFRICA  
E. L. Bateman  
Johannesburg, Transvaal

MEXICO & CENT. AMERICA  
Oliver United Filters Inc.  
Oakland, Calif.



When inquiring check CP 3203 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

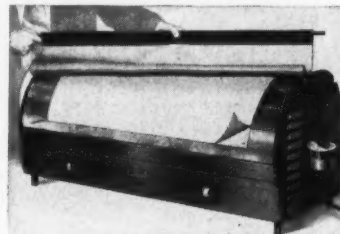
### Ammonia-type whiteprints printed, developed . . .

whiteprinter uses dry ammonia-fume diazo reproduction method

**Uses:** For clearly and accurately printing and developing blue line, black line, sepia intermediate, and other ammonia-type colored line whiteprints.

**Features:** Uses the dry ammonia-fume method of diazo reproduction.

**Description:** Ammonia fume exhaust fan operates independently, evacuating fumes when machine is shut down. Employs mechanical



Ammonia-type whiteprinter

torque converter drive. Both cut sheets and roll stock up to 42" wide in any length can be handled. Compact printer has variable speed from 4" to 5' per min; developer is set at 6' per min. Heating element in developer can be adjusted within 40° range to accommodate different grades and weights of sensitized paper.

All controls and delivery chutes are at the front, visible to operator. Unit includes storage cabinet and large feedboard. Plugs into standard 115 volt, 60 cycle AC line; no skill or experience is needed.

**Source:** Versa-Liner Model D is made by Peck & Harvey, Dept. CP, 5736 N. Western Ave., Chicago 45, Ill. . . . or for more information check CP 3204 on handy form, pages 2 and 3.

### Announces extinguisher for metal fires . . .

pressurized unit may be used to fight fires from safe distance

**Uses:** Pressurized extinguisher designed to combat metal fires. Effective on fires in magnesium, sodium, potassium, zinc, powdered aluminum, etc.

**Features:** Metal fires may be fought at safe distances, minimizing danger of burns.

**Description:** In operation, extinguisher shoots stream of dry powder over flames. Agent fuses to form air-excluding crust over the burning metal.

Without oxygen, fire goes out. Ex-

## STORAGE SYSTEMS tailor-made by MARIETTA

Your individual storage requirements are best fulfilled by a "tailor-made" system by MARIETTA. Our Engineering Department will draft a plan to provide bone-dry storage and low cost materials handling tailored to your tonnage and volume requirements. No obligation, of course.

Wire or write nearest office today.

OUR OWN ERECTION CREWS DO ALL THE WORK

the MARIETTA CONCRETE corp.

Dept. 46 Marietta, Ohio

Branch Office: Race Road and Pulaski Hwy.  
Baltimore 21, Md.

When inquiring check CP 3205 on handy form, pgs. 23

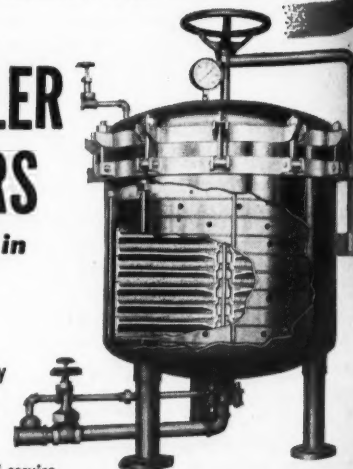
## UNEQUALED IN FILTERING CHEMICALS

for — HIGH FLOW RATES  
LESS DOWN TIME  
POSITIVE CAKE STABILITY  
QUALITY, SPEED AND ECONOMY

## SPARKLER FILTERS

Available in

stainless steel  
mild steel  
rubber lined  
monel, nickel  
bronze, Hastelloy  
steam or brine  
jacketed



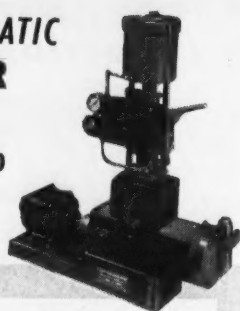
Write Mr. Eric Anderson for personal service on your engineering problems.

SPARKLER MFG. COMPANY, Mundelein, Illinois

When inquiring check CP 3206 on handy form, pgs. 23

## Lapp AUTO-PNEUMATIC PULSAFEEDER

piston-diaphragm  
metering chemical pump  
with automatic output  
control



Applicable to all pneumatic or electro-pneumatic instrumentation. Provides automatic metering in response to variable flow, pH, temperature, liquid levels, pressure, or other processing variables. Operates at constant speed—variable flow results only from variation in piston stroke length, controlled by pneumatic cylinder. Pumping head isolates chemical being pumped.

**WRITE** for complete description and specifications. Lapp Insulator Co., Inc., Process Equipment Division, 414 Maple St., LeRoy, N. Y.

# Lapp

PROCESS EQUIPMENT  
CHEMICAL PORCELAIN VALVES • PIPE • RASCHIG RINGS  
PULSAFEEDER CHEMICAL PROPORTIONING PUMPS

When inquiring check CP 3207 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

tinguishing agent is moisture-repellent, free-flowing, non-toxic, non-corrosive and non-abrasive, does not conduct electricity, and will not deteriorate under normal conditions.

Extinguishers are available in 30, 150, and 300-lb sizes, and are on Defense Order allocation. Larger units, including automatic piped system, are also available.

**Source:** Met-L-X extinguishers are products of Ansul Chemical Company, Dept. CP, Marinette, Wis. . . or for more information check CP 3209 on handy form, pages 2 and 3.

### Grooves in center block dissipate friction heat in universal joint . . .

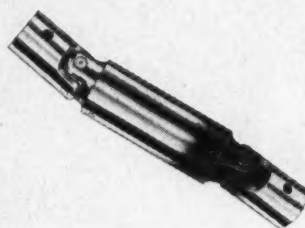
each bearing surface is broken into four smaller areas

**Uses:** Universal joints designed primarily for applications where joint friction heat must be dissipated rapidly.

**Features:** Joint will dissipate heat faster than conventional joints.

**Description:** Joints are available in sizes of 1 1/4" OD and larger, with solid or bored hubs and round, keyed, or splined shafts.

Dissipation of friction heat is accomplished by use of grooves cut into



Heat-dissipating joint is at left

center block. Two grooves break each bearing surface into 4 smaller areas, thus distributing wear and lubrication more evenly.

Illustration shows contrast between this joint and standard joint. "Lo Friction" joint, used on driving end, is at left, while standard joint on driven end is at right. Test was conducted with load limits and angles of operation far beyond normal conditions; notice how standard joint is discolored by heat, and approaching failure.

**Source:** "Lo Friction" universal joints are made by Curtis Universal Joint Co., Inc., Dept. CP, Springfield 7, Mass. . . or for more information check CP 3210 on handy form, pages 2 and 3.

# OLIVITE ACID-HANDLING PUMP

• Its Worth Proved by Its Widespread Use

• Its Versatility Proved by the

Many Products Handled

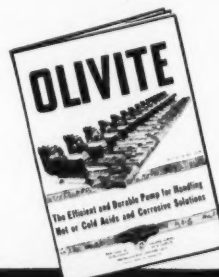


**D**uring 1949 and 1950, we sold many Olivite Pumps. What they

were installed to handle may be of even more interest. Here is a typical list:

- Hydrochloric Acid
- Hydrofluoric Acid (50% at room temperature)
- Phosphoric Acid
- Sodium Hypochlorite
- Zinc Chloride
- Hydrofluosilicic Acid
- Acetic Acid
- Spin Bath Solutions
- Ammonium Sulphate
- Chlorinated Brine
- Sulphuric Acid (hot)
- Ferric Chloride

**S**OME of these solutions are hot; some cold. Many are very corrosive. Yet the Olivite takes them all in stride. As a matter of fact, there are few hot or cold chemicals that OLIVITE or OLIVEX—the contacting materials in the pump—cannot withstand satisfactorily. Hydraulically, the pump is efficient. Three sizes are available: 1 1/4, 2 and 4 inches.



In writing for Bulletin 308-R, tell us in detail about your pumping problem. We have the ODS Diaphragm Slurry Pump, too, which may be more suitable.

## OLIVER UNITED FILTERS INC.



New York 18—33 W. 42nd St.  
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Oakland 1—2900 Glascock St.  
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Orillia, Ontario

HAWAIIAN ISLANDS  
Honolulu  
A. R. Duvall

AUSTRALIA  
Hobart Duff Pty., Ltd.  
Melbourne

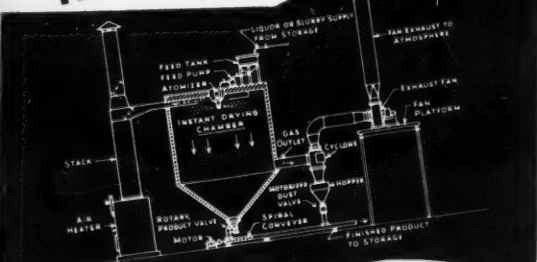
EUROPE & NORTH AFRICA  
Dorr-Oliver S. A. Brussels  
Dorr-Oliver S.N.A.R.L. Paris  
Dorr g.m.b.h. Wiesbaden (16)  
Dorr-Oliver Co., Ltd., London, S.W. 1  
Dorr-Oliver S.a.R.L., Milano  
Dorr-Oliver, N.V. Amsterdam-C

SOUTH AMERICA & ASIA  
The Dorr Co., New York  
PHILIPPINE ISLANDS  
E. J. Nell Co., Manila  
WEST INDIES  
Wm. A. Powe—Havana

SOUTH AFRICA  
E. L. Bateman  
Johannesburg, Transvaal  
MEXICO & CENT. AMERICA  
Oliver United Filters Inc.  
Oakland, Calif.

When inquiring check CP 3211 on handy form, pgs. 2-3

## LIQUID TO POWDER IN A SPLIT SECOND!



FOR  
CHEMICALS  
FOOD PRODUCTS  
SOAP POWDERS  
CLAYS & CLAY SLIPS  
PLASTICS  
BY-PRODUCTS  
WASTES

**Instant Drying System**  
Units are operating commercially on the drying of these materials. A large manufacturer of wall tile says their Instant Drying equipment "has produced . . . greater quantity . . . better quality . . . an economy of labor and an ultimate over-all cost reduction for the finished product."

Write us about your drying problem. Arrange with us for test runs on your material at our Poughkeepsie plant.

**INSTANT DRYING CORPORATION**  
101 Park Avenue, New York 17, N.Y.

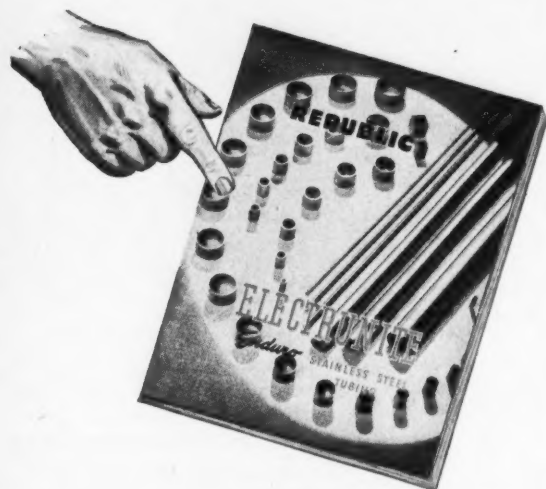


Testing & Research  
Laboratories at  
Poughkeepsie, N.Y.

Engineering by CLARK, MacMULLEN & RILEY, INC., N.Y.

When inquiring check CP 3208 on handy form, pgs. 2-3

# Have the facts and figures on **STAINLESS STEEL TUBING** at your fingertips



**SEND FOR THIS FREE BOOKLET TODAY**

Tubing data tables... properties tables... data on engineering, fabricating and corrosion... typical applications. You'll find them all in this helpful 28-page booklet compiled by Republic Steel, world's largest producer of alloy and stainless steels.

This valuable aid in selecting, specifying, fabricating and maintaining stainless steel tubing and pipe is yours for the asking. Just write to:

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**ELECTRUNITE®**  
STAINLESS STEEL TUBING AND PIPE

When inquiring check CP 3212 on handy form, pgs. 2-3

Page 112

## PROCESSING EQUIPMENT

### RLM-certified lighting units listed in tabular form

Four-page bulletin contains complete listing of all RLM manufacturers and the RLM-certified lighting equipment made by each. Featured is a well-organized table which shows: 1) whether or not a certain size and type of lighting unit is RLM-certified; 2) the names of all manufacturers who make RLM-labeled units of the type and size desired; and 3) those lighting units not yet certified but in the process of being inspected and tested.

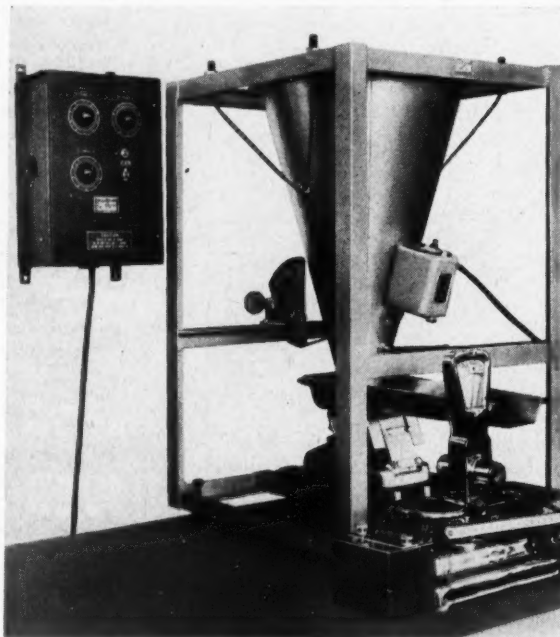
To facilitate the procurement of additional data concerning any individual manufacturer's units, the bulletin also contains an alphabetical listing of all RLM member manufacturers, with complete address of each. Bulletin 1050 is issued by RLM Standards Institute, Dept. CP, 326 W. Madison St., Chicago 6, Ill. When inquiring specify CP 3213 on handy form, pages 2 and 3.

### Batches, bags, feeds or compounds bulk materials at high speed...

semi-automatic machine utilizes photoelectric controls for bulk and dribble feeds

**Uses:** For semi-automatic batching, packaging, feeding and compounding of chemicals, plastic powders, granular materials, pharmaceuticals, powdered metals and many other products in powder, flake, or crystal form.

**Features:** High speed with accuracy. Fast feed delivers bulk at high rate to scale. Slow feed provides accuracy.



Typical assembly of amplifier, hopper, scale, controls

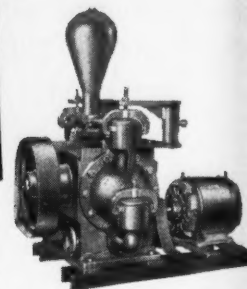
Danger of human error is eliminated. Flexibility permits adaptability to a wide range of materials and operations.

**Description:** Machine is comprised of a precise scale of appropriate capacity, speed and sensitivity, equipped with double photoelectric cell controls; an electric amplifier unit; and a vibratory type feeder complete with feeder-conveyor with two rates-of-feed-controller; hopper vibrator; and supporting frame.

Empty packages are placed on scale platter manually.

## Is It Rough—Is It Tough— Is It Terrible to Handle?

then let  
**SHRIVER  
DIAPHRAGM  
PUMPS**  
do it



Are the materials you must pump abrasive, corrosive, thick, heavy, viscous? Do they wear out or gum up your pumps, causing frequent shut-downs, breakdowns, replacements?

Then you need a Shriver Diaphragm Pump. It's positive acting, provides ample suction and pressure, simplifies and reduces cost of maintenance. Liquid-contacting parts made of any metal, rubber or plastic-coated.

Thousands in use prove their economy. Get Bulletin No. 126.

- **Cost Less to Operate and Maintain**
- **No Wear on Working Parts**
- **No Leakage**
- **Easy to Clean**

**T. SHRIVER & COMPANY, Inc.**

846 Hamilton St.

Harrison, N. J.

When inquiring check CP 3214 on handy form, pgs. 2-3

## The Valve That **IMPROVES** WITH USE



In the EVERLASTING VALVE, the disc is always in contact with the sealing surface of the seat. Each time the valve is opened or closed, the disc moves across the seat with a rotating motion, and this self-lapping action continuously polishes the sealing faces, keeping the seal drop-tight.

And note these additional EVERLASTING features... straight-through flow... no lubrication required... quick operation... non-wedging. These unique valves are ideal for all blow-off, shut-off, equipment outlets and many other services, and are suitable for all liquids, vapors and gases. Write for bulletin today.

EVERLASTING VALVE CO., 49 Fisk St., Jersey City 5, N. J.  
Trade Mark "EVERLASTING" Reg. U.S. Pat. Off.

**Everlasting  
Valves**  
for everlasting protection

When inquiring check CP 3215 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## PROCESSING EQUIPMENT

Switch then starts vibratory feeder and the hopper vibrator. After the bulk fill, the photoelectric control on the scale automatically cuts off the fast feed and the hopper vibrator, and starts the slow feed, which automatically cuts off at exact weight.

The exact weight control unit consists of an electronic amplifier, mounted remotely from the scale, and photoelectric tubes with light source, mounted on the scale. An amplifier unit contains thyatron tubes, relays, transformers, etc., and is usually mounted in the feeder control cabinet.

Photoelectric tubes are mounted on adjustable brackets on the scale and so arranged that the operating point of each may be adjusted independently by infinite steps.

Controller cabinet contains dial rheostats for controlling the rates of feed of material through the feeder trough, and a rectifier which converts alternating current into sharp pulsating current for feeder's magnetic drive.

A number of models are available, offering choice of hopper capacities for meeting specific requirements of a wide range of materials.

**Source:** Weighing machines for packaging are built by Exact Weight Scale Company, Dept. CP, 909 W. 5th Ave., Columbus, O. . . or for more information check CP 3216 on handy form, pages 2 and 3.

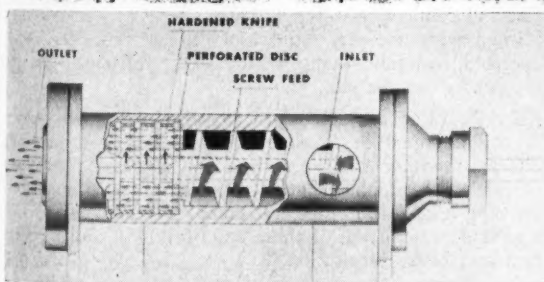
### No heat build-up in disc dispersers . . .

dispersion is a shearing action requiring no cooling

**Uses:** Disc-Type dispersers (laboratory and production models) developed especially for grease manufacturers. Have applications in the emulsions field with slight modification.

**Features:** Emulsion that is produced by the laboratory model is exactly duplicated by the production model. This is possible since both are equipped with perforated discs having the same size holes through which the emulsion is forced by means of feed-screw pressure.

Specially designed shearing knives between discs revolve at high speed, thus imparting a shearing action to the



Cross-section view showing how material is dispersed in disc-type unit

emulsion instead of the usual tearing that generates excessive heat. Consequently, no cooling arrangement is required here.

**Description:** Increase in dispersing action afforded by the units results in much smaller drive motors than are customarily required by dispersing operations in grease-making, including dispersing of bentones.

**Source:** Fully illustrated catalog of units has been prepared by the Chaffee Design & Manufacturing Company, Dept. CP, East Aurora, N. Y. . . or for more information check CP 3217 on handy form, pages 2 and 3.

# FULTON MULTIWALLS

## growing GROWING GROWING!

The growing number of enthusiastic users of Fulton Multiwall Paper Bags is the best proof of their outstanding quality. The largest users in the industry have honored us with their highest compliments and demonstrated their complete satisfaction by impressive re-orders — again and again.

We appreciate this confidence in the uniformly high quality and workmanship that goes into the making of Fulton Multiwalls in our New Orleans plant. Whatever your requirements may be — any size, all types, pasted or sewn bottom, open mouth or valve — Fulton makes the Multiwall to fit your product. Try Fulton for your next order of Multiwalls.

**Fulton BAG & COTTON MILLS**

ATLANTA • ST. LOUIS • DALLAS • DENVER  
KANSAS CITY, KANS. • NEW ORLEANS  
MINNEAPOLIS • LOS ANGELES • NEW YORK CITY

When inquiring check CP 3218 on handy form, pgs. 2-3

# IN CHLORINATION... the SIMPLE Way is the BEST Way!

Here's chlorination that's extra easy. Plants that use Builders Visible Flow Chlorinizers profit in many ways by their unique simplicity. These chlorine gas feeders are easy to understand, easy to operate, easy to service. Chlorination — whether manual, semi-automatic, program, or flow-proportional — is a safe, dependable

operation when it's handled by Builders Chlorinizers. They are easily serviced by any competent mechanic and individual parts and sub-assemblies are easily replaceable. For complete information and Bulletins, address Builders-Providence, Inc. (Division of Builders Iron Foundry), 387 Harris Ave., Providence 1, R. I.



**BUILDERS** makes a complete line of flow meters and controllers for liquids, steam, air, gas, and dry materials... mechanical and differential... including The Venturi Meter and Chlorinizers (chlorine gas feeders).

Installation at R. I. State Sanitarium, Wallum Lake, R. I.



**BUILDERS-PROVIDENCE**



When inquiring check CP 3219 on handy form, pgs. 2-3

## The BLAW-KNOX Electro-Vapor® Heating System provides a continuous cycle...

This improved method of heat application for the chemical and process industries combines a jacketed reaction vessel of conventional design with an electrically-heated Dowtherm vaporizer, in a single compact unit. Electrical energy is transformed into heat by Blaw-Knox immersion heaters. Dowtherm is vaporized and transfers its latent heat to the inner vessel by condensation. The cycle of vaporization and condensation is continuous, and the fast, uniform, efficient heating inherent in vapor systems is fully realized.

For a brief description of Blaw-Knox Electro-Vapor Heating Systems write for Bulletin No. 2324.

PROCESS EQUIPMENT DEPARTMENT

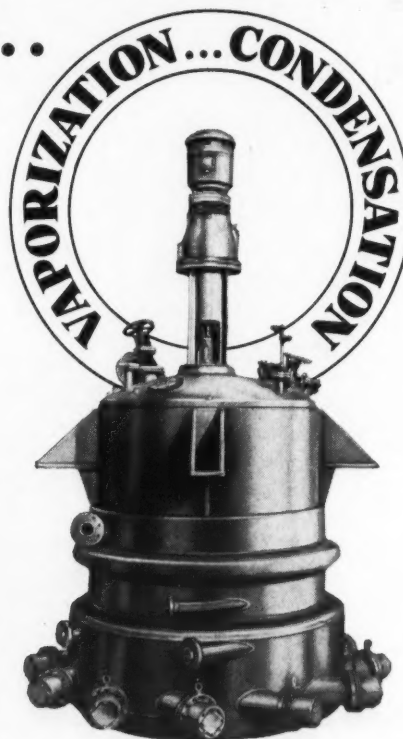
**BLAW-KNOX**

DIVISION OF BLAW-KNOX COMPANY

2076 FARMERS BANK BLDG., PITTSBURGH 22, PA.

Other Offices in Principal Cities

When inquiring check CP 3220 on handy form, pgs. 2-3



## PROCESSING EQUIPMENT

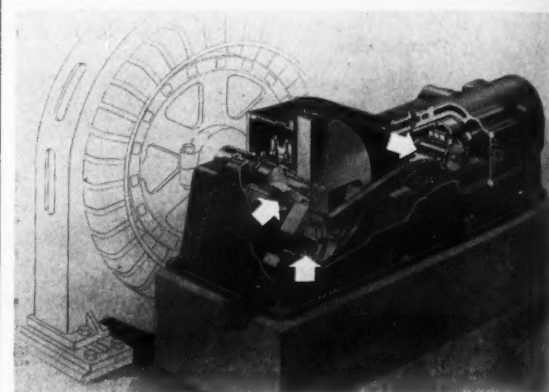
### Anti-friction roller bearings practical when compressor has oil injection system...

bearings are self-adjusting; smooth in operation; system simplifies maintenance

**Uses:** Available for air and gas applications requiring capacities of 350-10,000 cfm.

**Features:** Use anti-friction roller bearings throughout instead of conventional sleeve-type bearings in running gear of these horizontal-duplex compressors. Spherical roller main bearings support the crankshaft and are also used at the crank pin end of the connecting rod; double row needle bearings are used in the crankhead end of the connecting rod.

It has been considered impractical to use roller bearings in side crank-type compressors because the main bearings were installed between balanced crank discs permanently



View shows heavy-duty bearings of compressor

attached to the shaft ends. Removal and replacement of the crank discs or main bearings would entail a difficult operation requiring heavy special equipment. Recent development of the oil injection system of bearing removal, when applied to compressor bearings and crank discs, makes the application of roller bearings throughout easy. Oil injection system design permits use of one-piece crank-disc and connecting rods. Maintenance is easy and accomplished with ordinary hand tools and a portable, hand-operated hydraulic pump. No heavy pullers or presses are needed on the job.

Roller-bearings are self-adjusting, eliminating all chance of misalignment in maintenance. Pounding of bearings due to misadjustment is eliminated. Compressor operation is quiet and smooth. Capacity regulation and lubrication are simple and foolproof, yet completely automatic. Design and construction of these units result in cooler operation and better lubrication.

**Description:** These compressors are direct driven by engine-type synchronous motors. These are located between the compressor frames. Motor rotor is mounted directly on crankshaft, providing a compact and efficient drive. Cylinders are double-acting and equipped with builder's "simplate" valves. They are provided with jackets and are mounted on heavy-duty, totally-enclosed vapor-proof frames. Crankshaft is heavy, open-hearth steel forging accurately turned and finished all over. It is large at the center and tapers towards the ends, affording a stiffness required for supporting the rotor of the motor.

The oil injection system works as follows: A simple hydraulic pump is used to inject oil between the bearing

CHEMICAL PROCESSING

## PROCESSING EQUIPMENT

or crank disc and tapered shaft. The oil pressure expands the inner bearing race and the oil film reduces friction between the parts as the pressure separates the contacting surfaces. This friction loss and resultant axial components of force causes the crank disc or bearing to pop off the shaft. Parts are installed in the same manner. After the part is positioned on the shaft the oil pressure is released and contact is restored.

In addition to standard sizes of compressors in range 350-10,000 cfm, other sizes and types are available for higher and lower pressures.

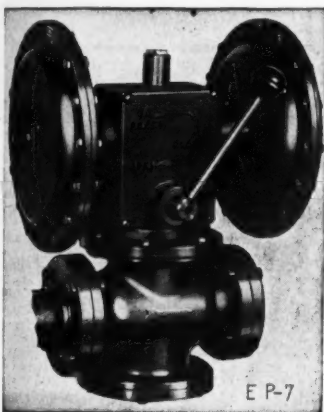
**Source:** Class O-CE compressors are built by Chicago Pneumatic Tool Co., Dept. CP, 6 East 44th St., New York 17, N.Y. . . . or for more information check CP 3221 on handy form, pages 2 and 3.

### Manual re-set provision of gas shut-off valve lends extra safety . . .

once closed, valve can only be reopened by hand after unsafe conditions have been corrected

**Uses:** Shut-off valve for providing safety on gas-fired installations.

**Features:** Gives double protection. In case of flame failure, valve is closed and held by coil spring. Valve can then only be opened or re-set by hand after the unsafe condition has been corrected. This eliminates the possibility of valve's being blocked open.



Shut-off valve must be manually re-set for operation.

**Description:** Valve can be supplied either with electric solenoid or with diaphragm actuators. All units have flange connections for ease in servicing; alloy construction lends light weight. Protective combinations in valve are highly flexible for adapting to individual requirements, and can

be removed, replaced, and interchanged without taking valve out of gas line. Valve is available in pipe sizes to 4" with gas capacities to 7250 cfh (based on 1/2" pressure drop).

Further details are contained in maker's Bulletin M-302.

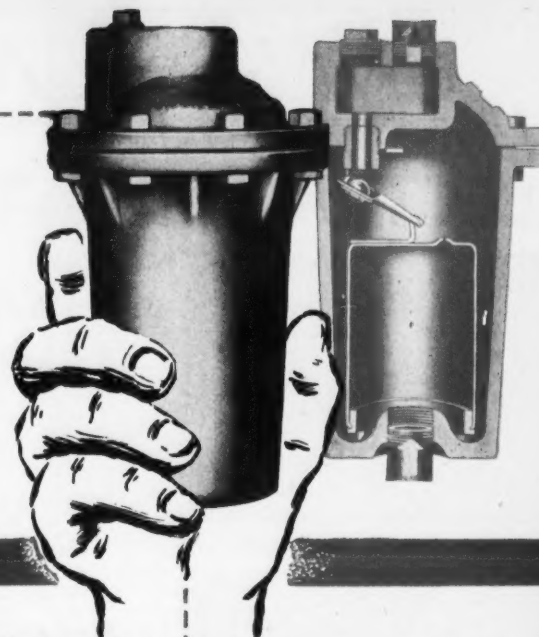
**Source:** McKee Lock-Tite valve is product of Eclipse Fuel Engineering Company, Dept. CP, Rockford, Ill. . . . or for more information check CP 3222 on handy form, pages 2 and 3.

### Survey gathers information on hot-spray lacquer

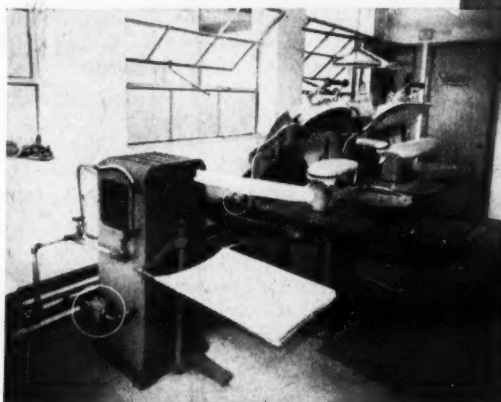
Twelve-page summarization of a survey on hot-spray lacquer clearly shows exactly what users think about this process — advantages, difficulties, applications. Form 500-131 is issued by Hercules Powder Company, Dept. CP, Wilmington, Del. When inquiring specify CP 3223 on handy form, pages 2 and 3.

FEBRUARY, 1951

# THIS will plug the holes in your boiler!



**33 1/3% REDUCTION IN ANNUAL COAL BILL** after installing Armstrong traps on cooking vats — a Midwestern lumber company.



**\$59.62 FUEL SAVINGS PER MONTH** after unit trapping a Milwaukee dry-cleaning plant with only 14 small sized Armstrong traps.

### What Holes? Steam trap holes!

The orifice in a steam trap is just the same as a hole in your boiler if it leaks steam. A 1/4" hole (orifice diameter of a medium sized 100 psig trap) will leak over \$100 worth of steam a month. Now, if you had 100 traps . . . but you don't need to figure the possible steam loss if you have Armstrong traps. Here are a few reasons why:

1. Valve and seat of chrome steel heat-treated, ground and lapped. Will not wire draw or pound out.
2. All other working parts of 18-8 stainless steel for long wear and corrosion resistance.
3. Buckets have generous buoyancy margin of safety to prevent prime loss.
4. Dirt can't settle on valve or seat to hold orifice open.
5. Nothing to stick or bind to prevent valve from closing.
6. Backed by 40 years of experience in building inverted bucket traps.

Get the full story from your Armstrong distributor or write for a copy of the **ARMSTRONG STEAM TRAP BOOK** — complete data on operation, selection, installation and maintenance of traps. Free on request.



**ARMSTRONG MACHINE WORKS**

880 Maple Street • Three Rivers, Michigan

# ARMSTRONG STEAM TRAPS

When inquiring check CP 3224 on handy form, pgs. 2-3

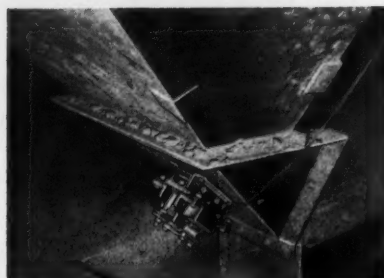
# SYNTRON

"Pulsating Magnet"

## ELECTRIC VIBRATORS



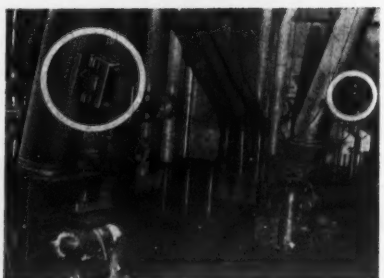
On Small Hoppers



On Small Bins



On Large Bins and Bunkers



On Chutes

**SYNTRON CO.**

110 Lexington

**SAVE  
MANPOWER!**

**Assure  
FREE-FLOWING  
Bins, Hoppers,  
Bunkers & Chutes**

Their 3600 vibrations per minute assure a smooth, effortless, controlled flow of material through bins, hoppers and chutes — save equipment and manpower by eliminating pounding, hammering and rodding. They prevent loss of costly time due to material coming "short" on dependent operations and prevent loss of material due to "surges".

They can be applied to any size and shape of bin, hopper and chute—whether made of steel, wood or concrete—handling bulk chemicals, rock, sand, coal, etc.

WRITE — giving the details of your problem thickness or gauge of hopper wall, overall dimensions, description of material—weight per cubic foot, moisture content, mesh—our Engineering Department will be glad to give you their recommendations.

Homer City, Pa.

When inquiring check CP 3224A on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

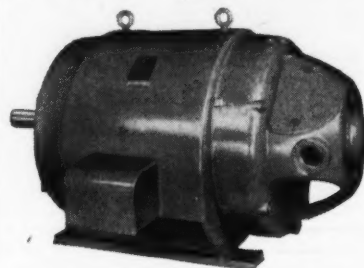
**Power ratings to 1500 hp,  
at variable speeds  
from motors . . .**

useful on applications requiring high starting torque, low current

**Uses:** Heavy-duty wound-rotor induction motors; especially advantageous on applications requiring high starting torque with low starting current, or long acceleration periods. Motors provide variable speeds.

**Features:** Brush pressure is easily adjusted with a ratchet wheel brush tension adjuster, which provides metered step-by-step increase or decrease of pressure on individual brushes.

**Description:** Motors are available in ratings from 30 to 1500 hp. Drip-proof construction is furnished as standard, with splash-proof or en-



This induction motor is rated at 200 hp, 1750 rpm

closed models also available. Either ball or split-sleeve bearings are furnished, and are readily accessible for inspection and maintenance.

**Source:** Wound-rotor induction motors are made by Electric Machinery Mfg. Co., Dept. CP, Minneapolis 13, Minn. . . or for more information check CP 3225 on handy form, pages 2 and 3.

**Stainless steel is employed  
as construction material  
for flexible hose . . .**

takes advantage of metal's resistance to corrosion, fatigue, heat

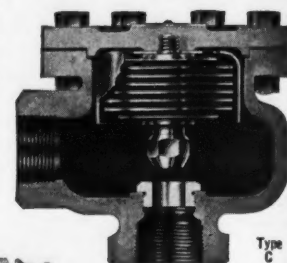
**Uses:** As a flexible connection carrying steam, liquids and gases between two movable parts of machinery. Also for connecting misaligned parts and compensating for slight expansion and contraction due to temperature change. Can be used to isolate vibration and noise that might be transmitted through rigid piping. Applicable to air conditioning and refrigeration, where corrosion resistant flexible steel connections are desired.

**Features:** Being made in stainless steel Types 304, 316, 310 and 347, and also in Carpenter No. 20 to handle sulfuric acid. These materials

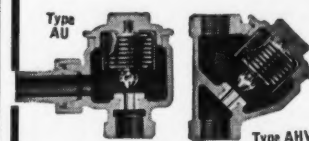
## 15 of 20 Engineers Prefer Nicholson Traps

To determine the best steam trap on which to standardize, a large processing firm recently asked their plant engineers for their preference. In 15 out of 20 plants the choice was Nicholson. The repeated adoption of Nicholson steam traps by plants currently in big "cost-reduction-through-modernization" programs is another indication of their advanced features. To learn why an increasing number of leading plants are standardizing on Nicholson thermostatic steam traps send for our catalog.

**5 TYPES FOR EVERY  
APPLICATION,  
process, heat, power.  
Sizes 1/4" to 2"; press.  
to 225 lbs.**



Type C



Type AU

Type AHV

**BULLETIN 450  
or see Sweet's**

**W. H. NICHOLSON & CO.** 181 OREGON STREET  
WILKES-BARRE, PA.  
Sales and Engineering Offices in 53 Principal Cities

When inquiring check CP 3226 on handy form, pgs. 2-3

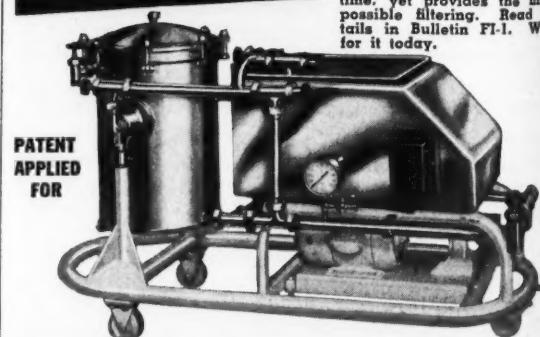
## GROEN FILTER

VERTICAL  
TUBE

**offers  
new FILTERING EFFICIENCY**

**NO CLOTH BAGS • NO  
SHEETS • NO PAPER PADS  
SELF-PROLONGING FIL-  
TRATION CYCLE • COM-  
PLETE PRODUCT RECOVERY  
THOROUGH AUTOMATIC  
CLEANING**

Modern, faster, much more economical filtering of liquids . . . with the rigidly proven GROEN Stainless Steel Sanitary VERTICAL TUBE FILTER . . . a new member of the widely used GROEN Line of Industrial Processing Units. Shown is Model LSP40, available portable or stationary. Effects COMPLETE PRODUCT RECOVERY. Greatly prolongs filtering cycle. Exclusive backwashing method eliminates disassembly. THOROUGH CLEANING a matter of mere minutes. No hoses or scrap time. Saves BIG on labor and time, yet provides the finest possible filtering. Read details in Bulletin FI-1. Write for it today.



**PATENT  
APPLIED  
FOR**

Branches: 30 Church St., New York 7; 420 Market St., San Francisco 11.

**GROEN MFG. CO.** (HALF A CENTURY  
OF FINE FILTERS)  
4531 West Armitage Avenue, Chicago 39 ILLINOIS

When inquiring check CP 3227 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## PROCESSING EQUIPMENT

offer high corrosion resistance, heat resistance (no scale forms at temperatures to 2100°F), and high fatigue resistance.

**Description:** Stainless steel corrugated flexible metal hose is fabricated from thin wall tubing. It can be made for low or high pressures. For high pressure, the hose is covered with one or more tubular wire braids to supply added strength and prevent elongation. Test pressures range up to 5000 psi.

Sizes range from 1/4 through 4" ID, and wall thicknesses from 0.010 in the 1/4" size to 0.035 in the 4" size. Hose is made in two patterns, normal and close pitch. The first has a free flexing radius from 10" in the 1/4" size to 41" in the 4" size. The last has a free flexing radius from 5" in the 1/4" size to 33" in the 4" size.

**Source:** Development of Allied Metal Hose Co., Dept. CP, 37-46 9th St., Long Island City 1, N. Y. . . or for more information check CP 3228 on handy form, pages 2 and 3.

## Ratings of 500 to 7500 kw set for steam turbine-generator units . . .

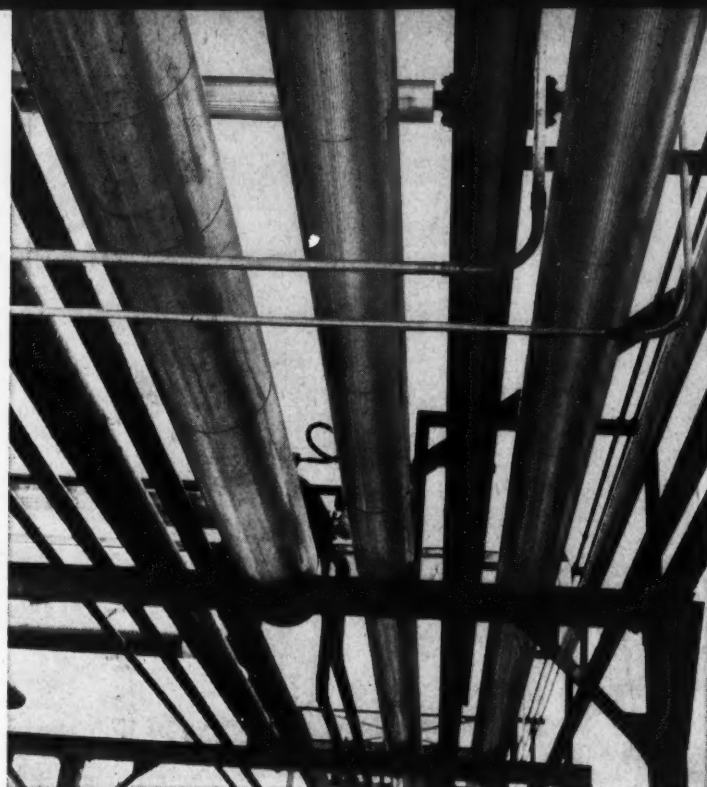
provide for paralleling with existing units, tie-lines

**Uses:** Generating electrical power from steam. Units can operate with economical regenerative feedwater heating cycles and can be tied in thermodynamically to provide a steam-power balance where low-pressure process steam is utilized. Governor and regulating characteristics provide for paralleling with existing units and tie-lines.

**Description:** Ratings of the WA-Series steam turbine-generator units range from 500 to 7500 kw. Design incorporates the simplicity of 3-bearing unit construction with a quality multi-stage impulse turbine, a housing type generator, and direct-connected exciter construction. Design includes forged rotor and bucket wheel discs, chrome steel buckets, labyrinth type shaft gland and interstage packing, and enclosed oil piping above the foundation in both generator and turbine.

**Source:** Allis-Chalmers Manufacturing Company, Dept. CP, 1151 S. 70th St., Milwaukee, Wis. . . or for more information check CP 3229 on handy form, pages 2 and 3.

For more information on product at right, specify CP 3230 . . . see information request blank between pages 2-3.



This close-up clearly shows the ribs or corrugations which add strength to Childers Jacketing and also make it form more easily around lines. Aluminum strapping and seals are a quick, inexpensive way to attach the jacketing. They can be used without any special tools and take no special training for the installers.

Does long lasting aluminum cost too much for covering your insulated lines? Not when you specify this new type weather-proof jacketing. It has been specially developed to cost little more than ordinary temporary jacketing materials.

## New Low-Cost Jacketing Cuts Maintenance on Insulated Lines

AT LAST an aluminum jacket has been "engineered" especially to protect outdoor lines in refineries and chemical plants. It is the first "permanent-type" jacketing that offers both low initial cost and low application cost.

After two years of tests and major installations at 431 outdoor locations in chemical plants, refineries and power plants, the Childers Manufacturing Co. of Houston has rung up an impressive cost-cutting record with their Childers Aluminum Jacketing.

Secret behind this low cost is the thin aluminum sheet—.006" thick—which is the weather-protecting sheath of the jacketing. It is ribbed (as pictures show) for extra strength and to facilitate form-

ing around the line. This aluminum has proved thick enough to resist weathering and usual abrasion, but costs much less than heavier aluminum sheets.

Easy application of this Childers Jacketing cuts labor bills drastically. It comes from the factory in easy-to-handle rolls that are four feet wide and either 100 feet or 200 feet long. It is light and flexible to handle as the men put it on the line. No roll forming required as with heavy, un-crimped material. It can be cut off and attached just the same as the old-fashioned tar-paper that was sometimes used for jacketing.

You can attach Childers Jacketing around your insulated lines by one of several easy methods. The use of aluminum strapping and seals is probably the best. Sheet metal screws or Minnesota Mining's No. 471 tape can also be used. The Childers jacketing can be removed and re-used.

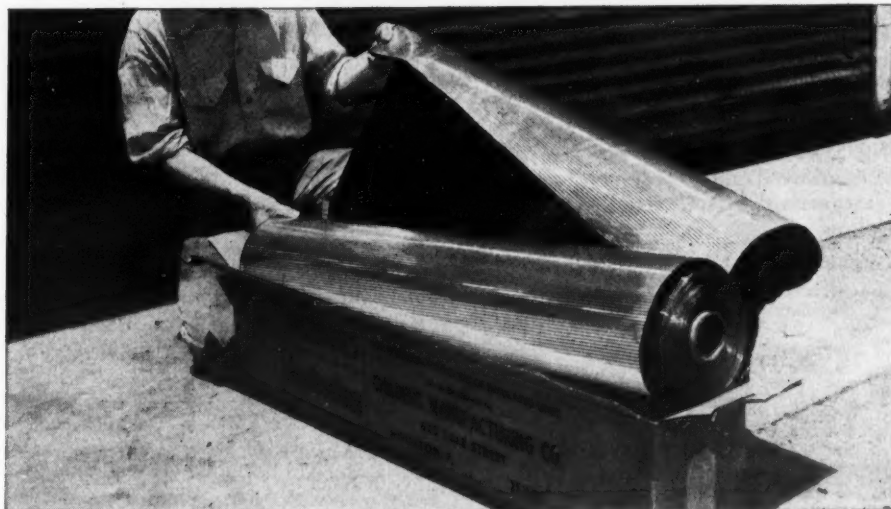
A moisture barrier is attached to the back of the jacketing to give positive protection for the aluminum when it is used with alkaline insulating materials.

No painting, no rust-proofing, little maintenance—that's the advantage of aluminum!

Hundreds of design engineers and maintenance engineers have agreed they save money for their firms and trouble for themselves by changing their jacketing specs to Childers 100%. That should make it worth your testing too—and a test roll costs only \$40.00 for 400 sq. ft. (with moisture barrier attached—price for 800 sq. ft. without moisture barrier \$62.00). That's a good investment in any plant. (Adv't.)

★ ★ ★

FOR FULL INFORMATION write Childers Manufacturing Co., Dept. LP-1, 625 Yale St., Houston 7, Tex., for complete literature. Childers has engineering representatives in principal cities to work with you on specific problems.



This is how Childers Aluminum Jacketing is shipped in easy-to-handle rolls. It is quite flexible, yet stands up under severe weathering.

**No LOST  
PARTICLES  
in**

**NEWARK A.S.T.M.  
Testing Sieves**

- **NO CREVICES** between cloth and frame to catch and thus "lose" particles.
- **EXACT OPENINGS.** Newark Standard Testing Sieves are made to conform to the latest specifications of the National Bureau of Standards.
- **CLOTH STRONG and DURABLE.** We weave the metal cloth in our own plant, thereby controlling its quality.
- **RE-COVERING SERVICE.** When the wire cloth is worn out return the sieves for re-covering. Often there is a saving.

Our new four page folder gives complete details and specifications. May we send you a copy?

**Newark Wire Cloth  
COMPANY**

351 VERONA AVENUE • NEWARK 4, N. J.

When inquiring check CP 3231 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

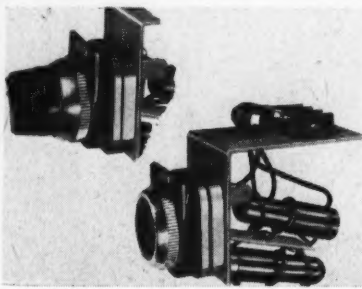
**No spark from switch  
when actuated . . .**

mechanical linkage offers safe operation in hazardous areas

**Uses:** Mercury switch, with push button or selector knob, that offers positive safety in hazardous, explosive locations.

**Features:** No possibility of spark because actuating linkage is purely mechanical in nature.

**Description:** Unit consists of hermetically sealed mercury switch mounted on lever-operated armature.



Details of sparkless mercury switch, both selector knob and push button types

Knob or push button inclines armature to actuate. Designed for vertical panel mounting, switch is single pole, single or double throw type.

**Source:** Safety switch is made by Panalarm Products, Inc., Dept. CP, 7212 N. Clark St., Chicago 26, Ill. . . . or for more information check CP 3232 on handy form, pages 2 & 3.

### Getting more production from doctor blades

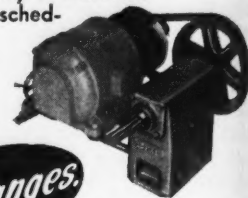
Based on actual service records from pulp and paper mills, a 4-page, 2-color folder describes doctor blades that have outlasted conventional types by as much as 18 times. Although prepared especially for the pulp and paper industry, it contains information that should be of value to the chemical industry in general.

These blades are made from a nickel-copper alloy designated as "K" Monel, and are reported to eliminate stock discoloration due to corrosion. Hardness is said to be comparable to that associated with alloy steel. "How to Get More Production from Doctor Blades" illustrates and gives an account of these blades in service and, in addition, specifies blades of other alloys for a variety of services. Issued by The International Nickel Company, Inc., Dept. CP, 67 Wall Street, New York 5, N. Y. When inquiring specify CP 3233 on handy form, pages 2 and 3.

## 5 ways to use LOVEJOY VARIABLE SPEED PULLEYS

**FOR QUICK PRODUCTION CHANGES**

Speedability of different operators  
Variation in size of parts or stock  
Variation in temperature or humidity  
Variation in size or density of materials  
Changes in production schedules



**No Stops  
for Speed Changes.**

Easily installed with any equipment new or old. Finger-tip control. Available from fractional to 8 H.P. duties.

**SHIPPED FROM STOCK**  
Write for complete catalog today

**LOVEJOY FLEXIBLE COUPLING CO.**

5072 W. Lake Street Chicago 44, Ill.  
Also mfrs. of Lovejoy Flexible Couplings and Lovejoy Universal Joints

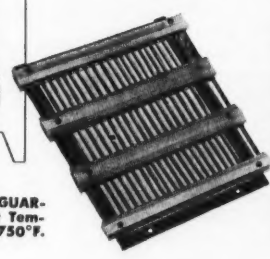
When inquiring check CP 3234 on handy form, pgs. 2-3

**Increase  
Your Sales** WITH THIS **5-YEAR  
GUARANTEE!**

### WIDE ADAPTABILITY

Kettles, ovens, drying machinery of all types, hamburger grills, glass annealers, space heaters, hot plates, high temperature air heating—are among the many successful applications.

If your product can be electrically heated . . . if it depends on long-sustained heating efficiency to fulfill its promise to the buyer . . . you can now back it up with a five-year heating unit guaranteed by using TRENT "FOLDED-AND-FORMED" Heating Elements in NEW STANDARD RACKS.



**FIVE-YEAR GUARANTEE . . . at Temperatures to 750°F. or 1350°F.**

Size 12" x 12", or multiples thereof, quickly, easily installed—horizontally or vertically—to give 1.5 KW to 300 KW, at low cost. Drilled for mounting.

**TRENT INC.**  
Electrically Heated Industrial Equipment  
235 LEVERINGTON AVE. PHILA 27 PA

When inquiring check CP 3235 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## PROCESSING EQUIPMENT

### One-man operation is feature of wheeled, dry chemical fire extinguisher . . .

nitrogen under pressure sprays 150 lb of dry powder to combat Class B and C fires

**Uses:** Mobile dry chemical fire extinguisher with 150-lb powder capacity for combating flammable liquid (Class B) and electrical (Class C) fires in industrial plants, textile mills, garages, refineries, utility power plants, and similar industrial locations.

**Features:** Extinguisher is mounted on 2 large wheels, and properly balanced to provide 1-man operation and mobility.

**Description:** Wheels support 2 cylinders, 50' hose, discharge nozzle, and pulling handle. Larger cylinder contains 150 lb of dry chemicals; smaller cylinder holds nitrogen under pressure of about 2000 psi.

To operate, valve on top of nitrogen cylinder is opened. This admits nitrogen to powder chamber through a normally-open valve, and pressurizes dry chemical for discharge. Pre-set regulator maintains constant pressure within dry chemical cylinder during discharge, and safety valve prevents damage to powder cylinder if pressure should exceed that for which regulator is set.



Mobile dry chemical fire extinguisher can be operated by 1 man

Discharge nozzle has stirrup-type control lever. Lever has 3 positions: Off, Fan, and Straight. Straight gives concentrated stream; Fan gives soft blanket effect to powder stream. All materials used in extinguisher are corrosion-resistant, and dry chemical mixture is formulated to prevent moisture absorption and clogging.

**Source:** 150-lb wheeled extinguisher is made by Walter Kidde & Company, Inc., Dept. CP, 40 E. 34th St., New York 16, N. Y. . . . or for more information check CP 3236 on handy form, pages 2 and 3.

### Specifies hydraulic drive pump for metering, proportioning

Four-page bulletin presents line of hydraulic drive pumps for metering and proportioning service. Pumps embody hydraulic displacement principle as means of stroke adjustment. Hydraulic cylinder is located between driving mechanism and pump plunger. Length of pump stroke is governed directly by amount of fluid contained in cylinder. Oil serves as hydraulic fluid and also acts as lubricant for the driving mechanism.

Large, detailed cutaway drawing, performance and material data, capacities and pressure ratings, and other specifications are contained in Bulletin PK-47, issued by Hills-McCanna Company, Dept. CP, 3025 N. Western Ave., Chicago 18, Ill. When inquiring specify CP 3237 on handy form, pages 2 and 3.

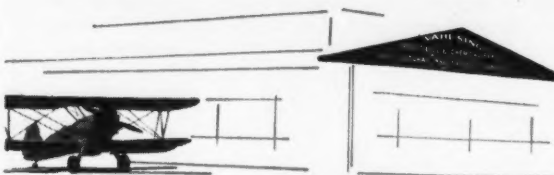
FEBRUARY, 1951

# pointers

## BETTER PROCESSING

EQUIPMENT INFORMATION FOR PROCESSING PLANTS

## Spatula Test—Yardstick of Perfect Blending



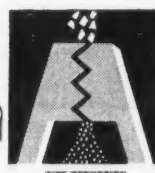
Powdered insecticides and fungicides must be uniformly blended and free of lumps. This is particularly important when the modern method of air-dusting is used for crop protection.

The Vahlsing Insect and Disease Control Service of Robbinsville, N. J. is one of the leading companies in the East engaged in air-dusting. Here is what Joseph P. McKenna, General Manager of the Vahlsing plant says about their S-W Blending Systems:

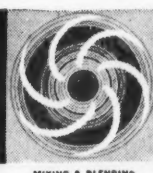
"Our equipment turns out a perfectly blended dust—free from streaks, at a most satisfactory rate. The *Spatula Test* proves our products have nothing to fear from the competition."

If you want to blend powders 100 mesh and finer, or combine them with liquids or fibers on a tonnage basis, a Sprout-Waldron Blending System is likely to offer you distinct advantages.

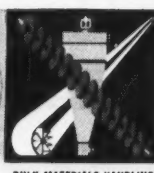
Here are just a few diversified products blended in Sprout-Waldron Systems: weed killers • industrial cleaners • ceramic bonding formulas • livestock mineral tonic blends • asbestos brake-lining formulas • joint finishing plaster • battery case formulas.



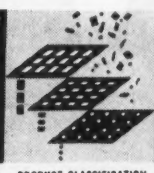
SIZE REDUCTION



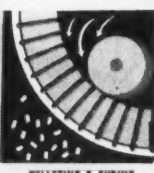
MIXING & BLENDING



BULK MATERIALS HANDLING



PRODUCT CLASSIFICATION



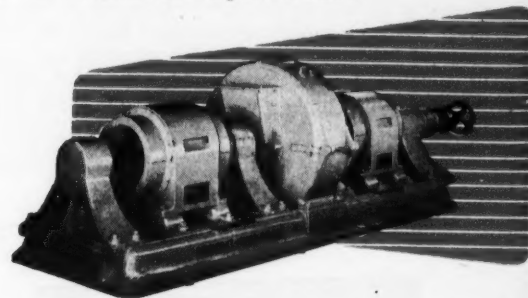
PELLETING & CURING

## Size-Reduction May Be Your Problem, Too!

Shellbuilder Company faced it in Houston, Texas over 25 years ago.

The product to be crushed was *oyster shell*. Uniformity of size range was a requisite—with capacities in tons per day. Average temperature of product at the time of grinding 200° F.

Obviously, the equipment for this work had to withstand severe punishment without expensive breakdowns. Product cost per ton had to be competitive in a world-wide export market.



Shellbuilder's choice in 1925 was two Sprout-Waldron 36" Double Runner Attrition Mills. Today, these same units are still in use. Capacity is still high. Plate life—1600 tons of oyster shell per set!

Many industries are rediscovering the basic advantages of this trouble-free mill on such varied assignments as grinding, cutting, shredding, pulverizing, granulating, etc.

For further information write to Sprout, Waldron & Co., Inc., 10 Waldron Street, Muncy, Pa.

## Sprout-Waldron

*Manufacturing Engineers*  
SINCE 1866

MUNCY • PENNSYLVANIA

When inquiring check CP 3238 on handy form, pgs. 2-3

# Delivery From Stock (While Supply Lasts)

## INTERNATIONAL 6-VOLT OIL-TESTING CENTRIFUGES

### DESCRIPTION

	Model F	Model G
Height, cover closed . . .	12½ in.	12 in.
Diameter of guard bowl . .	15¾ in.	13¼ in.
Diameter of base . . . . .	8¼ in.	8¼ in.
Net weight . . . . .	27 lbs.	24 lbs.
Shipping weight . . . . .	40 lbs.	32 lbs.
Packing case . . . . .	18x18x15 in.	15x14x15 in.

The Model F has a 2-place bronze head with attached rings for holding removable aluminum cups and cushions to accommodate the regular 100-ml. A.S.T.M. pear-shaped glass tube for making the Standard Method D-96-35 B. S. & W. Test. The rotating diameter from tip to tip of the glass tubes is 14¼ inches, which requires that the centrifuge have a minimum speed of 1,590 r.p.m., with the cover closed, according to the A.S.T.M. formula. The specially designed motor, which takes less than 9 amperes at full speed, drives the head and cups at approximately 1,900 r.p.m. with 6 volts at the motor terminals and 1,600 r.p.m. with 4.9 volts at the motor terminals.



3900

Series-type motor; will operate from any 6-volt storage battery. Enclosing guard bowl of 1/16-inch-thick steel with hinged cast-metal locking cover gives protection against both accident and dirt. Solid cast-iron base for stability, with 4 drilled holes for mounting bolts. Sealed bearings of the semi-lubricated type require only a few drops of oil occasionally. Supplied with 3 feet of heavy weather-proof cord and an armored cord connector. The heads are easily removable and are secured by a nut to the tapered shaft. Finished inside and outside with a heavy coating of dark gray lacquer.



3905

The Model G is equipped with 2-place flywheel-type weighted head with attached rings for holding removable bronze shields and cushions to accommodate the regular 15-ml. graduated 100% glass oil tubes for making the A.P.I. Code No. 25 B. S. & W. Test. The rotating diameter from tip to tip of the glass tubes is 11¼ inches. The special motor, which takes only 7.5 amperes at full speed, drives the head and shields at approximately 2,400 r.p.m. with 6 volts at the motor terminals and 2,050 r.p.m. with 4.9 volts at the motor terminals.

WRITE FOR  
BULLETIN  
50



**Refinery Supply Co.**  
621-23 E. 4th St. Tulsa 3, Oklahoma  
Laboratory Apparatus  
Instruments Chemicals  
MANUFACTURER OF R.S. SPECIALTIES

### PROCESSING EQUIPMENT

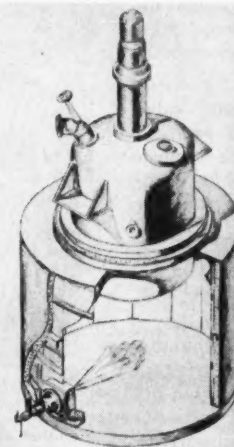
**Furnace's radiant heat flow absorbed by suspended vessel with no local hot spots . . .**

furnace may be oil or gas fired for efficient, safe heating of sensitive materials

**Uses:** Particularly suited for applications such as oil bodying, alkyd resin manufacture, varnish cooking, asphalt processing, plastic melting. Also in connection with processing and production of such products as waxes, deodorizers, syrups, inks and lubricants.

**Features:** Offers advantages in heating of kettles and autoclaves which process heat sensitive materials. In this new design, a rapid flow of radiant heat into the kettle, or autoclave, can be obtained without the development of hot spots.

Furnace temperature approximates that of the kettle rather than that of the heat source so that flow of heat automatically stops when burners are cut off. Some of the advantages of this furnace over the conventional type used for oil bodying kettles are as follows: 1) Since in this type furnace approximately 75% of the total heat to the charge is transmitted by radiation, it responds very rapidly to manual or automatic temperature controls. This is of considerable importance for oil bodying which normally is an exothermic reaction. The usual requirement is to heat the oil to the bodying temperature as rapidly as possible but not to exceed that temperature. In this furnace, the source of the radiant energy is removed as soon as the burners are cut off and very little additional heat is absorbed.



Vessel suspended in furnace for radiant heat absorption

2) Due to special design of the furnace, it has low heat capacity, and hence only a small amount of heat is stored in its walls. This also makes for good control since, when the burners are shut off, the kettle will not continue to receive appreciable quantities of heat such as is normally stored in the walls of a conventional furnace.

3) Operating costs of this furnace are considerably less than a conventional brick lined furnace, mainly due to its inherent low heat capacity and the related fact that oil bodying is strictly a batch operation requiring a large amount of heat in a short period of time, followed by a long period of very little, or no additional, heat input to the charge.

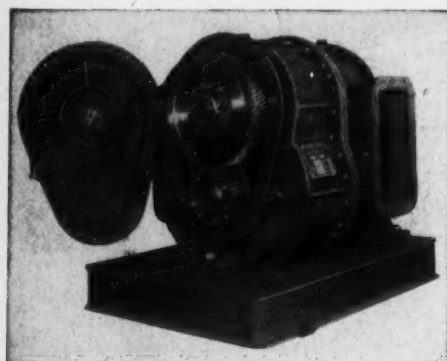
**Description:** Furnace can be fired by either oil or gas and does not require the use of an indirect heat transfer medium. Heated vessel is suspended in the furnace, as shown in the illustration, in such a manner that radiant heat absorption is very effective for the entire surface located within the furnace. Burners are mounted tangentially near the base of a furnace to produce a vortex of luminous flame. Burners normally operate with little more than the theoretical amount of air. When first placed in service, insufficient air is used for combustion in order to build up

When inquiring check CP 3239 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## Page 121

# The **STANDARD** **DAIRE** PRECISION BUILT *Axial Flow* **BLOWER** ~



Here's another important design feature of the Standard Daire Blower — **HEAT TREATED ALLOY STEEL TIMING GEARS**—generated and shaved to extreme accuracy for quiet operation.

THESE helical gears keep the cycloidal form, screw type rotors of the Standard Daire Blower in timed relation. There is no wind-up

in the shafts between the rotors and gears as a very small percentage of the in-put power goes through the timing gears. The male or main rotor does the work and consumes the power; the female rotor acts simply as a valve or gate—further evidence of the finer features found only in the Standard Daire Blower. The Standard Stoker Co., Inc. Dept. C-39 Lexington Ave., New York 17, New York.

*Write for*

comprehensive data on  
Standard Daire Blowers  
Publication No. 90



● Typical installation of a Standard Daire Blower as installed in a malting plant.

**THE STANDARD STOKER CO. INC.**

**Standard Stoker**



When inquiring check CP 3244 on handy form, pgs. 2-3

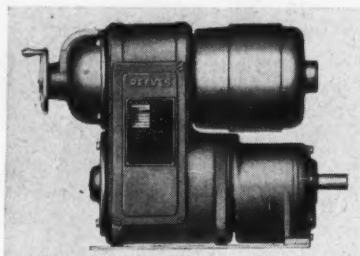
## PROCESSING EQUIPMENT

**Line of variable speed drives  
now extended to include  
fractional hp models . . .**

available in four sizes, with  
infinitely variable control

**Uses:** Provides infinitely variable speed control in fractional hp applications. Available in 1/4, 1/3, 1/2, and 3/4 hp sizes with ratios up to and including 10:1. Units are smaller models of established speed controller line.

**Features:** Screw-type control mechanism and dial indicator provide ac-



Speed controller has fractional horsepower applications

curate, non-fluctuating speed selection.

**Description:** Furnished for vertical or horizontal floor mounting, and horizontal wall mounting. Total of 24 different assembly combinations are available for each hp rating. Units measure 9 3/8" high when mounted horizontally, 16 7/8" high when mounted vertically. All operating parts are enclosed. Shaft extensions and other accessories are optional. Standard NEMA frame type C face-mounted motors are furnished.

**Source:** Series 1000 Vari-Speed Motodrives are made by Reeves Pulley Company, Dept. CP, Columbus, Ind. . . . or for more information check CP 3245 on handy form, pages 2 and 3.

### Radio-active contamination protection offered

Including photographs and details on 22 separate safety items, 8-page booklet is concerned with problems of air and surface contamination involving radio-active or toxic contaminants. Described are respiratory protective equipment, air sampling equipment, ventilation accessories, protective clothing, materials for contamination control, automatic artificial respiration instruments, and oxygen therapy equipment.

Bulletin G-10 is issued by Mine Safety Appliances Company, Dept. CP, Thomas and Meade Sts., Pittsburgh 8, Pa. When inquiring specify CP 3246 on handy form, pages 2 and 3.



Temperature regulation to plus or minus one degree F. is the unheard-of accuracy obtainable with the self-operated Farris Stacon Temperature Regulator.\*

Two design factors are responsible:

1. Liquid in bulb flashes to vapor in power bellows . . . steam does 99 per cent of the work . . . without appreciable time lag.
2. Full balancing bellows has the effect of double seated operation with single seated valve . . . eliminates spring counterpoise and all packing glands. . . provides free-floating valve disc . . . prevents response to variations in steam temperature.

Stacon Regulators are compact, trouble-free, dirt-proof. They operate consistently in the worst possible surroundings and require no maintenance.

You'll want to learn more about the most sensitive, accurate, economical temperature regulator on the market. Write for Stacon Bulletin 50-1000.

\* PATENTED

**Farris Stacon Corp.**

436 COMMERCIAL AVE.

PALISADES PARK, N. J.

© 6685

When inquiring check CP 3247 on handy form, pgs. 2-3

**you save 50%**  
in TANK HEATING and COOLING with

**PLATECOIL**

(REPLACE PIPE COILS)



- ★ You **SAVE 50%** in tank **SPACE**
- ★ You **SAVE up to 50%** in initial **COST**
- ★ You have **50% LESS WEIGHT** to handle
- ★ You **SAVE 50%** in maintenance **LABOR** as plates are changed from outside the tank without dumping solution

. . . besides all these you get faster heating or cooling. Take advantage of the engineering assistance offered by Kold-Hold to help you with your heat transfer problems.

Send for complete technical manual and descriptive Bulletin No. P54.

**PLATECOIL**

KOLD-HOLD MFG. CO.  
LANSING 3, MICHIGAN

When inquiring check CP 3248 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## PROCESSING EQUIPMENT

### Subject of accelerated tests cavitation-erosion

Twenty-page report deals with research on resistance of various metals to cavitation-erosion. Tests were made with accelerated-cavitation machine of vibratory type. Factors considered include amplitude of vibration, depth of specimen submergence, and types of test liquid (oils, acids, and alkalis were used). Secondary factors include materials and application techniques.

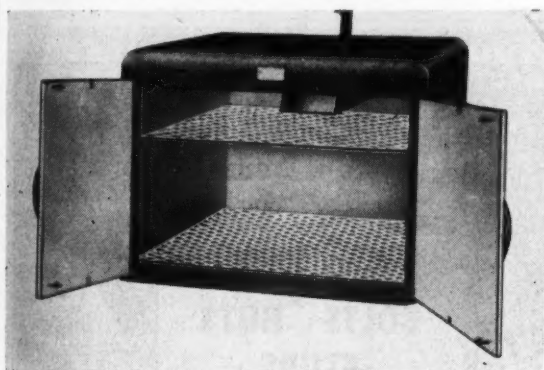
Report is profusely illustrated with photographs of test equipment and specimens, charts and graphs of test data, and drawings. Also included is bibliography and critical analyses of the report by various scientists and engineers. "Accelerated-Cavitation Research" is issued by Ampco Metal, Inc., Dept. CP, Milwaukee 46, Wis. When inquiring specify CP 3249 on handy form, pages 2 and 3.

### Ovens used singly or nested for baking and drying . . .

for applications involving lacquers, plastic granules, coil forms, and preheating of molds

**Uses:** Applications include baking enamels, lacquer, wrinkle and other finishes; dehydrating bobbins, coil forms, and paper tubing; drying plastic granules and parts after cleaning; preheating molds; and other uses.

**Features:** Uniform temperature throughout. Fresh air is drawn in and stale air driven out through specially located vents by means of a fan driven by a motor mounted on the outside of the unit. It is claimed that no stratifi-



Nesting oven has removable, adjustable shelf

cation is possible and that change of air and forced circulation is advantageous for any dehydration and baking process. Adjustable damper gives wide range of constant temperature.

**Description:** Construction is of heavy gauge steel with asbestos air-cell insulation. Model illustrated (#CR-1) has single phase, 110 volt motor. Units for DC lines are available. Oven is so constructed that one will nest on top of another. These ovens may be used in groups or operated individually. Also, selected ovens in the group can be cut-out, or heated to different temperatures.

Model pictured is 29" wide 24" deep 20½" high. Removable shelf permits use of entire height. Shelf and drip pan are standard equipment. Units are delivered all ready to operate. Other models for higher temperatures or models with 4 shelves are available.

**Source:** Grieve-Hendry Co., Inc., Dept. CP, 1101 N. Paulina St., Chicago 22, Ill. . . or for more information check CP 3250 on handy form, pages 2 and 3.



## In Shipping Containers—

**It's the CONDITION ON ARRIVAL**  
that sets the stage for your customers' feeling  
toward you as a supplier. Merchandise  
in factory-fresh condition is appreciated  
by the recipient.

Gaylord Boxes are protecting the  
products of many of the country's  
largest manufacturers — and  
have been for years.



**GAYLORD CONTAINER CORPORATION, General Offices: ST. LOUIS**

New York • Chicago • San Francisco • Atlanta • New Orleans • Jersey City • Seattle • Indianapolis • Houston • Los Angeles  
Oakland • Minneapolis • Detroit • Columbus • Fort Worth • Tampa • Cincinnati • Dallas • Des Moines • Oklahoma City • Greenville  
Portland • San Antonio • Kansas City • St. Louis • Memphis • Bogalusa • Milwaukee • Chattanooga • Weslaco • Appleton  
Hickory • Sumter • New Haven • Greensboro • Jackson • Miami • Mobile • Omaha • Philadelphia • Little Rock • Charlotte

# R·P·C VALVES



NO. 6056  
Forged  
Steel  
Gate Valve

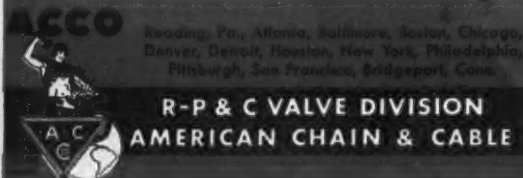
**Here is a Premium Valve  
that is NOT premium priced**

#### CHECK THESE DESIRABLE FEATURES:

- Bolted bonnet construction
- Heat-treated and hard chrome plated stainless steel wedge
- Stainless steel gland eye-bolts and nuts
- Two-piece gland and follower
- Tongue and groove bonnet joint

*It's well designed. It's low priced in its field.*

See your R-P & C distributor or write nearest R-P & C district office.



R-P & C VALVE DIVISION  
AMERICAN CHAIN & CABLE

"Intentionally Better"  
READING-  
PRATT & CARY  
VALVES

When inquiring check CP 3251 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

**Empties 55-gallon drum  
of SAE 30 grade oil  
in 2 1/2 minutes . . .**

transfer pump is air-operated,  
has capacity of 22 gpm

**Uses:** Air-operated fluid transfer  
pump for transferring lubricants,  
thinners, coolants, naphthas, non-  
corrosive chemicals, and similar ma-  
terials.

**Features:** Disc-type regulator per-  
mits simple control of output volume.

**Description:** Pump has maximum  
capacity of 22 gpm, can empty a 55-



Pumps weighs only 18 pounds

gal drum of SAE 30 oil in "slightly  
over 2 minutes". It fits all 2" open-  
ing drums, is made of steel, and  
weighs 18 lb.

Complete information is contained in  
maker's Bulletin 213.

**Source:** Speed-Flo transfer pump  
is made by Lincoln Engineering Com-  
pany, Dept. CP, 5780 Natural Bridge  
Ave., St. Louis 20, Mo. . . or for  
more information check CP 3252 on  
handy form, pages 2 and 3.

**Indoor-outdoor vacuum  
cleans warehouses,  
parking lots, etc . . .**

creates no dust clouds; picks up  
fine dust, paper, nails, sand

**Uses:** Indoor-outdoor vacuum  
sweeper for picking up everything  
from fine dust to welding rod butts.

For leaves, paper, sand, metal chips,  
nails and other refuse on all types of  
surfaces.

**Features:** Various models incorpo-  
rate features such as roller guides  
which prevent damage to walls while  
sweeping close; a foot pedal which



**LIQUID-PROOF  
HAND PROTECTION  
AT NEW LOW COST**

**NEOX**\*reinforced neoprene  
coated gloves

resist cutting, snagging and  
abrasion as well as grease,  
oil, acids, caustics, solvents.

\*NEOX (neoprene base with special toughen-  
ing additives) withstands both cutting and  
abrasion. Bonded to a strong fabric lining it  
provides a liquid-proof glove that will not  
snag or tear, resists destructive chemical  
agents and far outwears ordinary gloves.

**More Comfortable, Too.** The fabric lining in-  
sulates hands against heat and also makes the  
gloves easy to slip on and off.

**Special Test Offer.** Send brief description of  
your operation, materials handled and tem-  
perature conditions. We will forward samples  
of the type gloves we recommend for com-  
parative test and report. Address:

Edmont Mfg. Co., 501 Orange St.  
Coshocton, Ohio  
World's largest maker of coated  
industrial gloves

**Edmont**  
FABRIC-LINED  
NEOX-COATED  
GLOVES



Also plastic and  
natural rubber  
coatings, over  
all or palm only.

When inquiring check CP 3253 on handy form, pgs. 2-3

**Brass • Bronze  
Stainless • Monel  
Alloy Steels  
BOLTS NUTS  
STUDS**

Here's a full line of bolts,  
nuts and studs in all types of  
metals. Accurately threaded  
to assure a uniform Class 3  
Fit, Pawtucket products are  
made in standard dimensions  
or to your specifications.

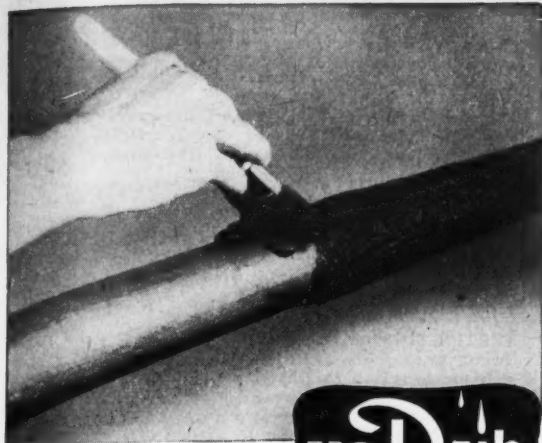
BETTER BOLTS SINCE 1882

Use Headed and Threaded Fasteners for Economy and Reliability

THE BOLT MAN  
**PAWTUCKET**  
MANUFACTURING COMPANY  
327 Pine Street - Pawtucket, R. I.  
THE PLACE TO SOLVE YOUR BOLT PROBLEMS

When inquiring check CP 3254 on handy form, pgs. 2-3

CHEMICAL PROCESSING



## COVER PIPES TANKS, WALLS

# NoDrip

Anyone can brush, trowel or spray NoDrip on any clean, dry surface. Goes on like plaster, forms a seamless, protective coating, **STOPS CONDENSATION DRIP!**



NoDrip keeps equipment and floors safe and dry; prevents corrosion of metal and prolongs its life. Acid, alkali and brine resistant. Comes in 1, 5, and 55 gal. drums, ready for use.

### TRY NoDRIP

Apply NoDrip to a small area, compare the results with uncovered portions.

Send for free NoDrip Handbook

J. W. MORTELL CO., 530 Burch St., Kenosha, Ill.

When inquiring check CP 3255 on handy form, pgs. 2-3

## STAINLESS STEEL TANKS

Special • Single Shell • Standard

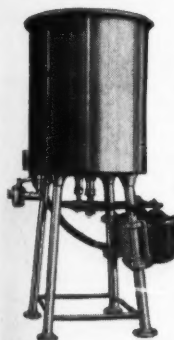
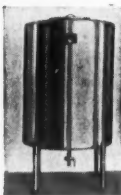
Designed and Fabricated to **YOUR specifications . . . all shapes and sizes up to 2000 gal. capacity.**

Accessories: agitators, gauges, special covers, special fittings, cooling and heating coils.



Our 15 years' experience and latest fabricating equipment assures **YOU** of the right tank for the job. **WRITE US TODAY** concerning **YOUR** problems. Our engineers will give **YOUR** inquiries immediate and personal attention.

We also manufacture equipment and materials for filtering and liquid handling.



**FILPACO INDUSTRIES**  
**The FILTER PAPER CO.**

2432 S. Michigan Ave. Chicago 16, Ill.

When inquiring check CP 3256 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

raises sweeper to pick up larger objects; easily-emptied hopper; etc.

Creates no annoying dust clouds; vacuums as it sweeps. Ease and efficiency of operation encourages frequent use. Fast and rugged, saving time and labor.

**Description:** Typical sweeping widths include 36 or 48", and in excess of 54" with curb brush attachment. Operator sits or walks, depending on model. Ball bearings throughout.

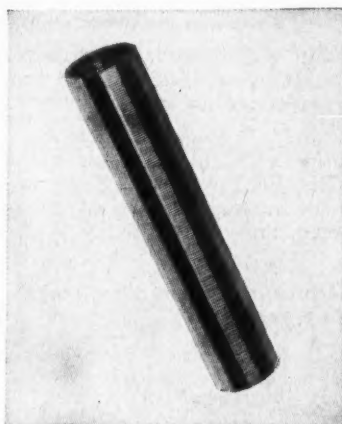
**Source:** Wilshire Power Sweeper Co., Dept. CP, 4615 Alger St., Los Angeles 39, Calif. . . . or for more information check CP 3257 on handy form, pages 2 and 3.

### Non-clog membranes speed filtration . . .

cylindrical screen cleaned automatically

**Uses:** Filtering membranes, in various alloys, for use in Titeflex and other industrial filters. Used within the filter to support the filter cake.

**Features:** Speeds filtration. Triangular cross-sectional shape of individual wire forming the cylindrical screen eliminates clogging. High efficiency in backwashing (the automatic



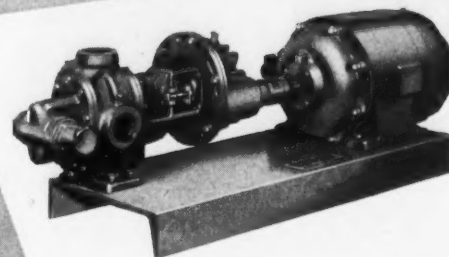
Triangular-shaped wires of screen are in stainless, other alloys

process by which Titeflex filters are cleaned without manual labor) since backwash flow reaches highest velocity at exact point of support of filter cake.

**Description:** In various sizes, and in any alloy which can be drawn into wire. Normally constructed of 316 ELC stainless steel. Name: "Well-Screen" membrane.

**Source:** Titeflex, Inc., Dept. CP, 500 Frelinghuysen Ave., Newark, N. J. . . . or for more information check CP 3258 on handy form, pages 2 and 3.

# EFFICIENCY PLUS



## THE DEPENDABLE ROPER

### FOR GENERAL PURPOSE PUMPING

What do you expect of the pumps you install? Efficiency, dependability, endurance, simplicity, an unusually high record of performance? If these are your requirements, by all means investigate the Roper 3600 Series; pumps that are engineered to do a wide range of jobs handling both thick or thin clean liquids.

At this very moment the interests of tank truck operators, refineries, bulk stations, process plants and general industries are being served by thousands of Ropers. The size for your needs can do an equally productive job for you!

### OUTSTANDING FEATURES...OUTSTANDING PERFORMANCE

Pumping liquids from A to Z calls for quality-made components accurately assembled. Series 3600 pumps feature hardened helical pumping gears; heavy duty, high-lead bronze bearings; adjustable relief valve (from 20 to 90 P.S.I.); split packing gland; one-piece case of practical design. Standard or special fitted models available. Pressures to 60 P.S.I. — capacities 40 to 300 G.P.M.

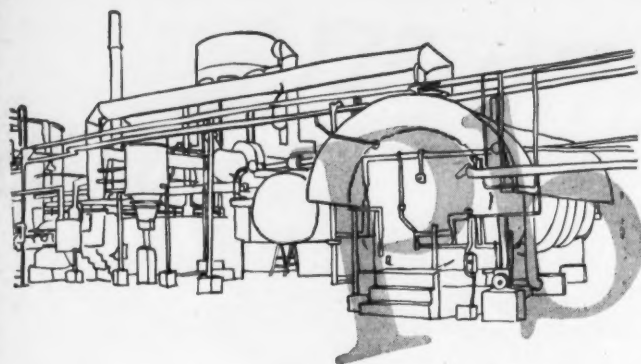


Send Today For  
**"HOW TO SOLVE PUMPING PROBLEMS"**  
FREE ON REQUEST



**GEO. D. ROPER CORP.**  
742 Blackhawk Park Ave.  
ROCKFORD, ILLINOIS

When inquiring check CP 3259 on handy form, pgs. 2-3



## USING SULFURIC ACID?

Under many pressures, concentrations and temperatures, lead is the ideal material for handling sulfuric acid. It safely handles other corrosives as well.

For fabrication, lead is unique. Sheet lead can be welded, or "burned", to form a continuous lining; it can be bonded to another metal. Lead can be cast, die cast or pressure molded; extruded as pipe or other shapes; fastened by welding, flanging or bolting. Once installed, lead chemical equipment is easily repaired with a welding torch.

Because of the many complex factors in any corrosion problem, expert advice is usually advisable. For complete technical assistance, see Federated first. For lead products, think of ASARCO Brand lead pipe, lead sheet, and lead fittings.

Available in all standard sizes and forms through Federated's 22 sales offices across the country.

**Federated Metals Division**



AMERICAN SMELTING AND REFINING COMPANY • 120 BROADWAY, NEW YORK 5, N. Y.

When inquiring check CP 3260 on handy form, pgs. 2-3

## ONE LITER HIGH PRESSURE AUTOCLAVE

PRESSURES UP TO 5,000 P.S.I.

A new and improved research tool for laboratories. Machined from stainless steel forgings for operating pressures up to 5,000 p.s.i. and temperatures to 650°F. Agitation up to a maximum of 1,000 r.p.m. available and can be varied through a variable pitch pulley at motor. Agitator internally water cooled at packing. Accessories are available including liners, making possible the processing of as little as 25 cc.

### SPECIALLY PRICED.

Completely self-contained including choice of heat. Electric and jacketed for vapor or liquid heating. Floor stand, automatic pressure lubrication at stuffing box, blow out assembly and explosion proof motor. Complete, ready to operate

\$1,145

WRITE FOR BULLETIN 8150

**AUTOCLAVE ENGINEERS, INC.**

860 EAST 19th STREET • ERIE, PENNSYLVANIA  
LABORATORY & PILOT PLANT HIGH PRESSURE EQUIPMENT



When inquiring check CP 3261 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

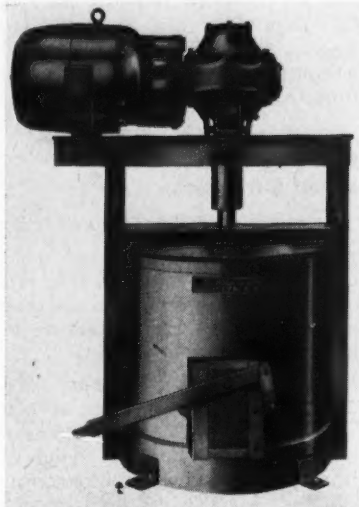
### Heavy duty gearhead motor rotates stirrer shaft to mix thick pastes . . .

automatic safety cut-off stops stirrers in emergency

**Uses:** Heavy duty paste mixer with capacity of 50, 100, or 150 gal.

**Features:** Mixer incorporates automatic safety cut-off which stops stirrers from revolving in an emergency.

**Description:** Right-angle gearhead motor is directly connected to stirrer



Complete paste mixing unit

shaft, eliminating intermediate parts. Maker reports that mixer can handle paste of heaviest consistency.

**Source:** Model 132 paste mixer is made by Charles Ross & Son Company, Dept. CP, Brooklyn, N. Y. . . or for more information check CP 3262 on handy form, pages 2 and 3.

### Attach mobile steam cleaner to plant lines . . .

compact, mobile unit cleans and sterilizes equipment

**Uses:** For use in steam cleaning operations where it is desired to utilize steam from plant lines. Cleans equipment, plant premises and facilities.

**Features:** Rapid cleaning and substantial savings in use of solvents and detergents since there is no dilution by large volumes of water. Also, in this system of steam-jet cleaning, solvent, detergent or paint stripper can be applied either alone or mixed with steam in any desired proportion.

**Description:** Cleaner unit includes a high pressure detergent tank mounted on a lightweight all-metal dolly with rubber tired 10" wheels and handle bar grips for easy mobility. It is built

Teflon "V" Rings constitute closest possible approach to a universal packing . . .

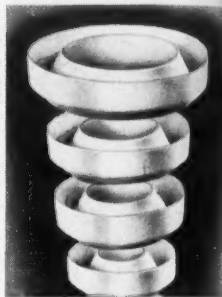
Newest Crane Packing Company "Chemlon" Product Features Special Molding Process and Patented Cross-Section Design

**USES:** All types of valve requirements, including rotary, spiral and reciprocating stem action; many centrifugal and rotary pumps; all reciprocating pump applications.

**FEATURES:** Molded from pure Teflon having chemical inertness unsurpassed by any other known packing material. These rings resist operating temperatures from as low as -94°F up to 500°F. They positively will not shrink, swell, harden, dissolve, corrode or deteriorate with age. Low friction characteristics cannot be matched; 1/15 that of compression packing is not unusual.

**DESCRIPTION:** Chemlon V Rings are furnished in a large number of stock sizes; additional sizes can be molded at a very nominal extra charge. Cross-section design allows effective sealing at finger tight gland pressure. Special molding process gives rings extra resiliency.

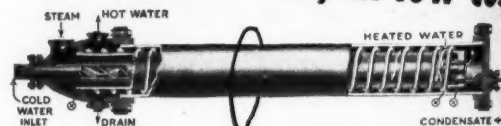
**SOURCE:** Crane Packing Co., Dept. CP-2, 1821 Cuyler, Chicago 13, Ill. Write for information on Teflon V Rings . . . and the complete Chemlon line of braided, molded, extruded and machined Teflon products.



TRADE MARK

When inquiring check CP 3263 on handy form, pgs. 2-3

## STEAMLINED! to heat water fast, at low cost



In the Johnson Heater, water to be heated is routed first inside, then outside, a blanket of live steam. It's full pressure steam, too; up to 150 lbs., or 250 lbs. in heavy duty types, no reducers are needed. The result: faster, more efficient heat transfer for a unit of its size. No wonder industry has found so many applications for the Johnson "Instant" Heater, in heating water and process liquids of various types.



Sizes for all needs; write for literature

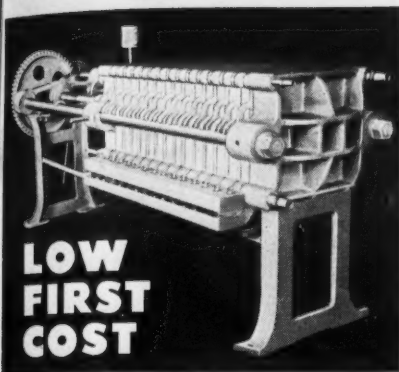


**The Johnson Corporation**

826 Wood St., Three Rivers, Mich.

When inquiring check CP 3264 on handy form, pgs. 2-3

CHEMICAL PROCESSING



**LOW  
FIRST  
COST**

## SPERRY FILTER PRESSES

And that's just the beginning of savings.

Sperry Plate Filter Presses offer substantial economies all along the line. Labor cost is low. Economy in floor space and head room. Low depreciation. And this type of filtration equipment handles the widest possible range of applications at maximum efficiency. Plate filter presses—the Sperry type—are the most widely used filters in industry today. Check your own filtration problem with Sperry. Send samples of your material for a test run and estimate. No obligation.

### D. R. SPERRY & COMPANY

BATAVIA, ILLINOIS • Filtration Engineers for over 50 years

*Eastern Sales Representative:*

H. E. Jacoby, M. E., 205 E. 42nd St., N. Y. 17, N. Y.  
Phone Murray Hill 4-3581

*Western Sales Representative:*

B. M. Pilchinsky, 833 Merchants Exchange Bldg.,  
San Francisco 4, Calif., Phone: DO-0375

**SPERRY  
FILTER PRESSES**

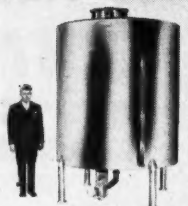
When inquiring check CP 3265 on handy form, pgs. 2-3

## LOMAX STAINLESS STEEL STORAGE • MIXING • PROCESSING TANKS

**LOWER FIRST COSTS**

**LOWER ALL-AROUND COSTS**

Modern streamlined welded construction throughout. STOCK OR TO YOUR SPECIFICATIONS. All over the world chemical, food and beverage processors say, "When you buy Lomax; you buy Quality" . . . . . developed in more than a quarter-century of experience. It will pay you to get the facts.



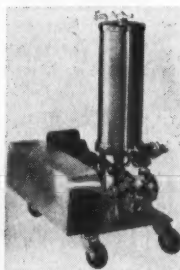
**OUR ENGINEERS  
ARE AT YOUR  
SERVICE FOR FREE  
PLANNING &  
ESTIMATES.**

**STORAGE TANKS:** Stainless, Monel, Inconel, Clad. Any size; any capacity. Vertical, horizontal, stock or to order. Meet all sanitary requirements everywhere.

**NEW 3 TO 5 GPM FILTER**

Handy, efficient, precision-built. Easily portable. Stainless steel and Nickel Alloy. 1/4 hp motor. Reasonably priced. Write for details.

**ACT NOW FOR  
QUICK SHIPMENTS**



TOP, SIDE OR BOTTOM AGITATING MIXING TANKS. ANY CAPACITY.

Write for special "THRIFTY" specifications.

FRANK B. **LOMAX CO. INC.**  
3518 N. HALSTED ST., CHICAGO 13

When inquiring check CP 3266 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

under ASME code, has 200 psi safety valve and all other necessary control valves. It carries National Board Stamping and Insurance Company Certificate.

Detergent tank is thoroughly insulated and enclosed in an enameled case. In operation, tank is filled with detergent or solvent, and steam is admitted in the top of the tank to put the liquid under pressure. Detergent flows from the bottom of the tank through the detergent hose to the steam lance. There it is atomized with the steam and directed with jet velocity under finger tip control.

Desirable operating steam pressures are in excess of 80 psi. Lower steam pressures can be used but are less effective.

*Source:* Speedyjet cleaner is built by Livingstone Engineering Co., Dept. CP, Worcester, Mass. . . . or for more information check CP 3267 on handy form, pages 2 and 3.

### Serrating graphite pipe with hand tool assures strong joints . . .

speeds pipe assembly on the job  
*Uses:* For use with impervious graphite pipe.

*Features:* Simple, rugged in design and extremely easy to use; assures a tight joint in a minimum of time.

*Description:* Effectiveness of joints where type FC flexible couplings are used depends to a considerable extent



Serrates graphite 1-6" pipe

upon the quality of the serrations on the pipe.

This hand serrating tool facilitates quick assembly of pipe in sizes from 1 to 6" inclusive.

*Source:* National Carbon Div., Union Carbide & Carbon Corp., Dept. CP, 30 East 42nd St., New York 17, N. Y. . . . or for more information check CP 3268 on handy form, pages 2 and 3.

Get TWICE the value  
for your steam trap dollar!



Just as the self-starter revolutionized the automobile, so Clark Duo-Step Leverage is changing old-fashioned ideas about steam trap efficiency.

Field and laboratory tests prove that Clark DUO-STEP Steam Traps more than *double* the drainage capacity of ordinary inverted bucket traps.

Ask your Clark representative for a demonstration on your steam lines—or write us for complete information.

Here's how DUO-STEP  
doubles drainage capacity



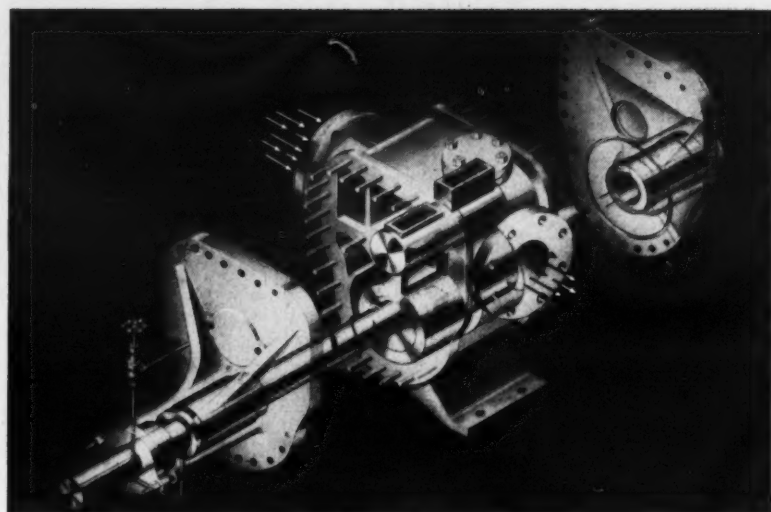
**THE CLARK MANUFACTURING COMPANY**  
1848 East 38th St. • Cleveland 14, Ohio

**Clark**  
THE HOME OF DUO STEP LEVERAGE

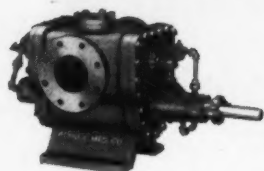


The complete line of dependable fluid controls

When inquiring check CP 3269 on handy form, pgs. 2-3



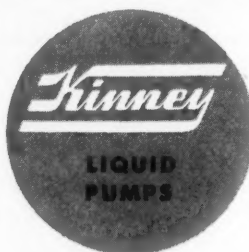
## WHAT CAN THIS PUMP MEAN TO YOU?



To the sugar refiner it means smooth, non-foaming pumping of even the most viscous syrups and gassy molasses. To the oil refinery operator it means high-efficiency pumping of asphalt, lube oils, greases, emulsions, etc. To the processor of foods and edible oils it means competent handling of everything from chocolate to lard, from fish oil to fig newton paste!

Yes, this unique pumping mechanism means many things to many different industries. It's the Kinney SD Rotating Plunger Pump . . . a pump that can mean important production and processing advantages to you. Perhaps some of your raw materials or products now being handled as solids can be pumped by an SD Pump. Perhaps you need a positive displacement unit that will pump liquids with meter-like volumetric accuracy. Perhaps you require the extremely high vacuum characteristics of this positive displacement unit.

Whatever your pumping problems, Kinney Engineers are ready to help you find the right pump for your needs. Send coupon below, or write giving complete details. Kinney Manufacturing Co., 3573 Washington St., Boston 30, Mass. Representatives in New York, Chicago, Cleveland, Houston, New Orleans, Philadelphia, Los Angeles, San Francisco, Seattle, and foreign countries.



### KINNEY MFG. COMPANY 3573 WASHINGTON ST., BOSTON 30, MASS.

Gentlemen: Please send me Bulletin L48 . . . the complete catalog of Kinney Liquid Pumps. My liquid pumping problem involves:

- |                                      |   |  |   |
|--------------------------------------|---|--|---|
| <input type="checkbox"/> Acid Sludge | <input type="checkbox"/> Lube, Diesel Oil, etc. | <input type="checkbox"/> Molasses        | <input type="checkbox"/> Tar                          |
| <input type="checkbox"/> Asphalt     | <input type="checkbox"/> Edible Oils            | <input type="checkbox"/> Paint, Enamel   | <input type="checkbox"/> White Lead                   |
| <input type="checkbox"/> Chocolate   | <input type="checkbox"/> Fuel Oils              | <input type="checkbox"/> Road Oil        | <input type="checkbox"/> Others (see letter attached) |
| <input type="checkbox"/> Crude Oil   | <input type="checkbox"/> Grease                 | <input type="checkbox"/> Soap, Glycerine |   |

Name  Company   
Address

When inquiring check CP 3270 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

### Motor, personnel safety highlights of starter . . .

can't be tampered with unless in "off" position

**Uses:** Starts, stops, and provides overload protection for single- and poly-phase motors, as well as DC types.

**Features:** Protection of operating personnel as well as machines is stressed by maker.

Self-indicating handle, interlocked cover that prevents opening unless starter is "off", and safety latch to lock starter "off" during servicing are personnel-protection features.

Motor protection is provided by the quick-make quick-break toggle mechanism and by the bimetallic disc-type thermal overload relay.

**Description:** Starter is designated as "Motor Watchman" Class 10-100-S1. Ratings are up to 600 volts, 7½ hp polyphase or 5 hp single phase AC, or 220 volts 1½ hp DC.

Wiring is designed to facilitate installation and servicing. All enclosures are bonderized to prevent blistering, flaking, and corroding.

**Source:** Development of the Westinghouse Electric Corporation, Dept. CP, 306 Fourth Ave., Pittsburgh 30, Pa. . . . or for more information check CP 3271 on handy form, pages 2 and 3.

### Shows minimum radii for tube bending

Slide chart presents data on desirable minimum radii for economical bending of stainless steel tubes and pipes. Chart covers tubing ranging from ¾ to 5" OD size, in B.W. gauges from 22 through 11.

Radii are given for machine bends (with and without mandrels) of 90 and 180°. Radii for bends from 45° to 180° in ornamental grade stainless steel tubing are also provided.

Stainless pipe schedules 5, 10, and 40 are described, and recommended coil diameters for stainless pipe from 1/8 to 4" are included. Chart also contains tables of standard sizes for round stainless steel tubing and pipe, a table for determining theoretical bursting pressures, and a table of analyses and physical properties for various types of stainless tubing.

Stainless Tube Bending Slide Chart is issued by The Carpenter Steel Company, Alloy Tube Div., Dept. CP, Union, N. J. When inquiring specify CP 3272 on handy form, pages 2 & 3.



## PICCOLYTE dependable

You are assured of dependable uniformity when you use PICCOLYTE, because of the rigid control of every step of manufacture. The photograph above shows the controls of the Polymerizer, the kettle in which resin is made from Pinene.

Manufacturing equipment is of the most modern design, and highly perfected instrumentation procedure permits operators to keep the material under constant observation during processing.

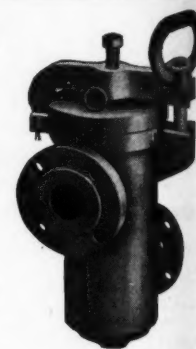
PICCOLYTE is a versatile resin, having properties that make it ideally suited for a wide variety of products. Write for bulletin giving complete details.

PENNSYLVANIA  
INDUSTRIAL CHEMICAL CORP.  
Clairton, Pennsylvania  
Plants at Clairton, Pa.,  
West Elizabeth, Pa.,  
and Chester, Pa.

Distributed by Pennsylvania Falk Chemical Co., Pittsburgh 30, Pa.  
and Harwick Standard Chemical Co., Akron 5, Ohio

When inquiring check CP 3273 on handy form, pgs. 2-3

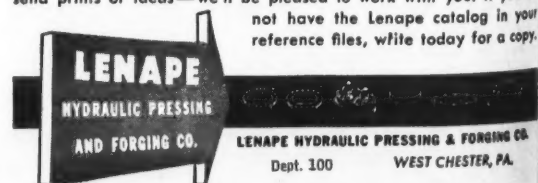
## Save Time USE STANDARD LENAPE PRESS FORMED PARTS



This strainer body is just one of many examples of the use of Lenape standard press formed parts to produce a highly satisfactory product without delay. All required design conditions were met by the use of 4" and 2" Lenape welding necks taken from stock—there was no waiting for castings, and the entire order was filled in less than two weeks.

Normally, Lenape welding necks, nozzles, covers and specialties are used on pressure vessels, tanks, towers and similar equipment.

If you believe we can be of service to you, do not hesitate to send prints or ideas—we'll be pleased to work with you. If you do not have the Lenape catalog in your reference files, write today for a copy.



LENAPE HYDRAULIC PRESSING & FORGING CO.  
Dept. 100 WEST CHESTER, PA.

When inquiring check CP 3274 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## PROCESSING EQUIPMENT

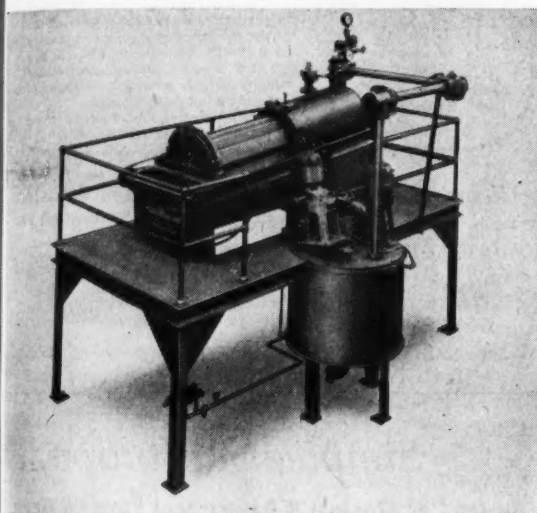
### Sulfur freed from dust, fly ash by clarification in package filter . . .

5 sizes cover range of 3 to over 200 sq ft of filtering area; leaf assembly easily cleaned

**Uses:** Offered particularly for clarifying molten sulfur, but design features suggest many other uses.

**Features:** Filter is assembled with all auxiliaries and accessories in a compact, ready-to-operate unit. Retractable filter leaf assembly is easy to clean, affording easy cake discharge: no scooping or digging cake from the filter body. Recent refinement is a simplified internal manifold type leaf outlet with single internal connection.

**Description:** Complete line comprises some five different sizes, including "packaged" units. These five sizes



"Packaged" sulfur clarification set-up

cover a range of 3 sq ft to over 200 sq ft of filtering area. Units are jacketed to maintain proper constant temperature of the sulfur charge during filtration. These units remove such impurities as plant dust, fly ash and siliceous matter which are picked up during transit and movement to storage. When the sulfur is remelted, these impurities in a short time choke burners, converters and other equipment, reducing operating efficiency and necessitating an eventual shutdown for clean-out.

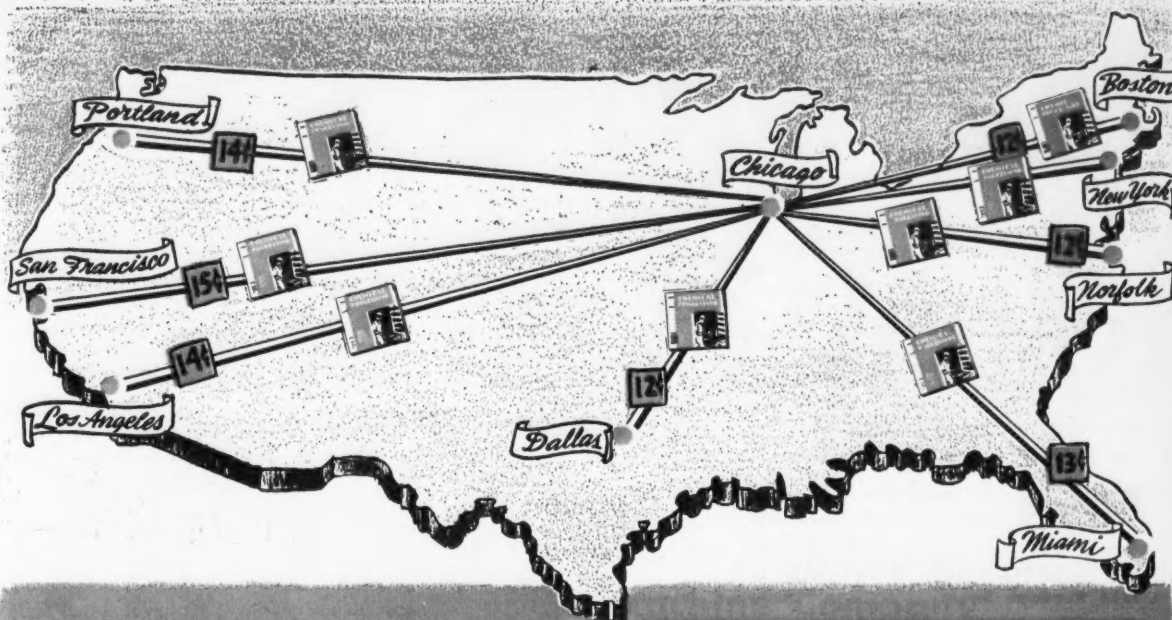
**Source:** Oliver United Filters, Inc., Dept. CP, 33 West 42nd St., New York, N. Y. . . . or for more information check CP 3275 on handy form, pages 2 and 3.

### Shows Impregnating equipment

Four-page, 2-color bulletin contains descriptions and illustrations of impregnating equipment for sealing, bonding, or disinfecting. Any porous material, or assembled articles having minute internal voids, can be impregnated with any material which can be made to flow and has proper surface tension characteristics.

Contents include information on tanks, pumps, and complete systems. Featured is photograph of a typical unit used for wax impregnation. Bulletin 501 is issued by Lammett & Mann Co., Dept. CP, 1753 Walnut St., Chicago 12, Ill. When inquiring specify CP 3276 on handy form, pages 2 and 3.

FEBRUARY, 1951



Can you guess how much it cost to mail you this copy of  
**CHEMICAL PROCESSING?**

15c . . . if you live in San Francisco. 12c if your home is in New York;  
14c to Portland; 13c to Miami; 8c if you live here in Chicago.  
That means 96c to \$1.80 per year . . . for postage alone.  
Yet this magazine comes to you without charge.

### Why do we do it?

Why don't we demand that you buy a subscription? Well, strange as it may seem, it usually costs more to sell a subscription than the publisher gets out of it . . . and a good many important men simply can't be reached when selling subscriptions.

Then where DO publishers' dollars come from?

Contrary to what many folks think, subscription revenue is hardly a "drop in the bucket" of a publisher's income. Most all of it must come from the advertising sold.

So the publisher must get maximum readership from the maximum number of readers in the field . . . from men like yourself . . . so his advertising pages will be of greatest value.

NBP

### Advertisers demand best coverage

Since the advertisers pay the bills, the publisher can succeed only as he publishes the most readable magazine and then gets the best possible coverage of the best readers in the field.

And, as you can see, the most effective method of getting such coverage is (a) to handpick the most important men and (b) send the magazine to ALL of these men.

That's why you get **CHEMICAL PROCESSING** . . . without charge. You are important in chemical processing, hence you are important to our advertisers, hence you are important to us as publishers. That's why we spend many thousands of dollars on every issue of **CHEMICAL PROCESSING**, to make it of top interest to you in your work — to make every issue more than worth your reading time. That's why **CHEMICAL PROCESSING** comes to you without charge.

CCA

**CHEMICAL PROCESSING**  
Published by PUTMAN PUBLISHING COMPANY  
737 N. Michigan Avenue CHICAGO 11, ILL.

Creators of PUT-STYLE magazines . . .  
terse editorial, square format, higher  
visibility, more **READER ACTION**



can be a good first step toward improving spraying operations in your plant. See for yourself how Spraying Systems' specialized experience in spray nozzle design and manufacture can work for you.

Get the EXACT spray nozzle type and size to fit your need.

**WRITE** for Catalog 22... General Catalog  
Catalog 23... Pneumatic Atomizing Nozzle Catalog.

### SPRAYING SYSTEMS CO.

3216 Randolph Street Bellwood, Illinois

FOR BETTER INDUSTRIAL SPRAYING



DESIGNED AND BUILT BY SPRAY NOZZLE SPECIALISTS

When inquiring check CP 3278 on handy form, pgs. 2-3



**INDISPENSABLE  
TO HEALTHIER INDUSTRIAL "PLANT" LIFE!**

## Tarbonis

is available in  
1-lb. and 6-lb. jars.

Industrial plants have long known the value of TARBONIS in maintaining top worker-efficiency wherever the hazards of skin irritations and guard against their recurrence.

You'll find TARBONIS will effectively relieve skin irritations and guard against their recurrence.

#### Common Skin Irritants

- Cutting Oils
- Chrome Dyes
- Sodium Bichromates
- Lime
- Metal Dust
- Urea and Phenol
- Plastic Compounds
- Naphtha
- Detergents

THE TARBONIS COMPANY, Dept. CP  
4300 Euclid Ave., Cleveland 3, Ohio

Please send me a free sample of TARBONIS.

COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_  
BY \_\_\_\_\_ DEPT. \_\_\_\_\_

When inquiring check CP 3279 on handy form, pgs. 2-3

Page 130

## PROCESSING EQUIPMENT

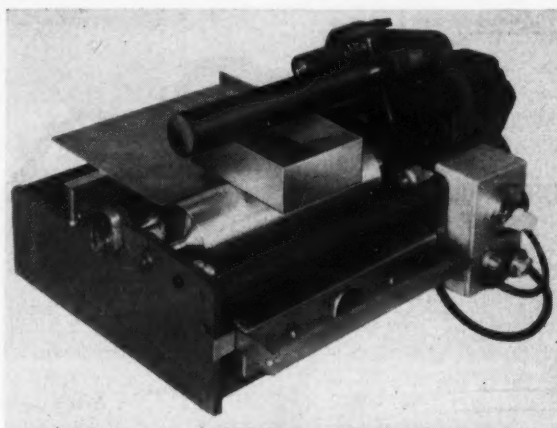
### Three-inch platform boxes given an even coating of adhesive...

adhesive is placed in stainless steel tank, kept at correct workable temps by thermostatic control

**Uses:** For applying a coat of adhesive to platform style boxes up to 3" high.

**Features:** Adhesive is placed in a removable stainless steel tank and kept at correct workable temperature by thermostatic control.

**Description:** In operation, box section is fed through gluer, which applies an even coating of adhesive over entire surface. Operator then places glued piece on the



Ductor roller gives box section of platform boxes an even coating of adhesive

platform. Coating thickness is regulated by adjustment control. Thorough adhesive coverage is accomplished by ductor roller.

Continuous operation is maintained by 1/3 hp, 110 volt AC motor. Overall dimensions of gluer: 32" deep, 10 1/2" long, and 11 1/2" high. Gluer is manufactured in sizes to accommodate boxes of 3 different widths, 6, 8, and 12".

**Source:** Platform box gluer is product of Potdevin Machine Co., Dept. CP, 1285 38th St., Brooklyn, N.Y. ... or for more information check CP 3280 on handy form, pages 2 and 3.

### Place external timing gears, bearings in housings, making unit integral with pump...

screw pumps can be furnished in horizontal, vertical construction

**Uses:** For positive displacement of non-lubricating liquids of all viscosities, at 1 to 700 gpm.

**Features:** External timing gears and all bearings are in housings which form an integral unit with the pump body. Thus, there can be no strain on bearings, or misalignment of shafts or rotors due to change of respective positions of body and separate housings. Timing gears and bearings move with pump body if there is a slight displacement of the pump elements during installation, or if pump body expands when handling hot materials.

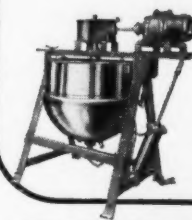
**Description:** "Bracket-Type" pumps are available in horizontal or vertical construction, in corrosion resistant alloys and with steam jacketed bodies and special stuffing boxes and bearings for high temperature applications.

## For Safety in DUMPING or CLEANING

## LEE HYDRAULIC OPERATING CYLINDERS



Operated Directly From Your Present Water System  
No New Lines Are Required!



All Lee Tilting Kettles and Agitators are available with Hydraulic Operating Cylinders to eliminate the dangers—such as scalding of the operator, loss of product or damaged equipment—caused by the ever-changing center of gravity when tilting. The smooth action of this cylinder permits perfect control and balance for safe pouring or cleaning of Lee corrosion-resistant kettles. Our descriptive bulletins on these units will be of interest to you.

## LEE

METAL PRODUCTS CO., INC.  
418 PINE STREET • PHILIPSBURG, PA.

ALL LEE KETTLES ARE  
MADE TO A.S.M.E. CODE

When inquiring check CP 3281 on handy form, pgs. 2-3



## Simpler Sanitation...

Instead of 12—Just 2 Rotary Seal Parts to Clean



- Super-streamlined, compact.
- Sanitary Corrosion-Resistant "Waukesha Metal" throughout—no painting, refinishing.
- Handles all liquids, semi-solids.
- New adjustable ball feet.
- Completely sanitary.
- Performance Tested for longer wear.
- Positive Displacement pumping.
- No-agitating, no-aerating—no-crushing.

\*P. D.—Positive Displacement for smooth flow.

WAUKESHA FOUNDRY  
COMPANY  
WAUKESHA, WISCONSIN

New in sanitary pump design, the Waukesha One-Piece O-RING Sanitary Seal eliminates the complicated parts of old-fashioned rotary seals. In each New Waukesha Pump, you have only TWO of these rings instead of the usual twelve parts— for time-saving disassembly and assembly. Already proven superior in performance and long service. The new One-Piece O-RING ROTARY SEAL is only one of many great advantages in the new Waukesha "P.D." Sanitary Pump. Get the whole story today. Write for latest bulletins and prices.

Waukesha 100%  
SANITARY  
PUMPS  
Dependable Product of a Responsible Manufacturer

When inquiring check 3282 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## PROCESSING EQUIPMENT

Hopper type bodies are available for extremely high viscosities.

For less wear on bearings and timing gears, rotors are positioned axially as well as radially. Axial control is provided by new thrust bearings in the form of double row angular contact ball bearings at the outboard end. These thrust bearings reduce sliding wear on the timing gears, and reduce friction by making possible the elimination of spacing washers between pump body and brackets. Radial control is provided by precision cut timing gears, and newly added heavy duty roller bearings.

Servicing is speeded by the new one point alignment, and by new bracket arrangement which allows faster assembly. Trial and error methods are unnecessary as all parts are automatically positioned by shoulders and locknuts. Pumps can be direct-connected up to 1,800 rpm.

**Source:** "Bracket-Type" screw pumps are built by Sier-Bath Gear & Pump Co., Inc., Dept. CP, 9252 Hudson Blvd., North Bergen, N. J. . . . or for more information check CP 3283 on handy form, pages 2 and 3.

### Lubricate stationary bearings with large capacity oilers . . .

avoid frequent refillings, easily installed; feed at set rate in required quantities

**Uses:** For applications on large stationary bearings, machinery, journals, conveyor drive chains and at other places where a large quantity of oil is required or when it is desired to extend reservoir filling intervals.

**Features:** Rate of flow easily and accurately regulated by simple needle valve control. Setting is firmly locked in place. Shutoff lever may be held at 45° angle to flush bearings when required, as, for example, when starting machines that have been idle for some time.



Lock-ring type oiler

Filler cap is dust-proof and self-closing and has an extended lip for convenience in opening with spout of oil can.

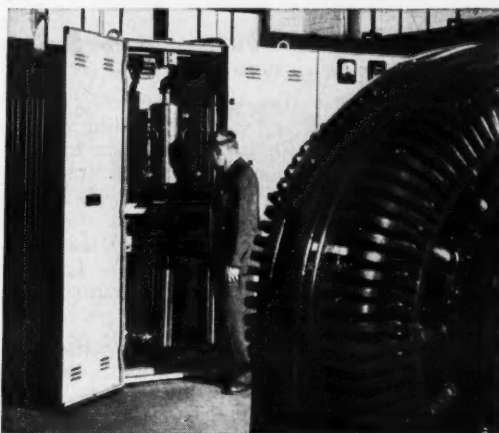
**Description:** Made in 10 oz., 1 pint, 1 quart and 2½ quart capacities. Reservoirs may be either Pyrex glass, recommended for high temperatures, or Lucite plastic, where surrounding temperatures do not exceed 160° F. When shutoff lever at top of oiler is in upright position, oiler feeds at the set rate. When lever is flipped to right, oil feed stops. Sight fittings have standard pipe threads for mounting on top of bearing or part to be lubricated. Oilers are also available with lock-on sight feed fittings for tightening to mounting bracket and with a compression fitting for connection to copper or Neoprene tubing. This style is recommended where it is not convenient or practical to mount oiler directly on bearing housing or where excessive vibration exists.

All metal parts are reinforced and silver-alloy brazed to provide one solid, non-leaking unit.

**Source:** Large capacity gravity feed oilers are made by Trico Fuse Mfg. Co., Dept. CP, North Fifth at West Chambers, Milwaukee, Wis. . . . or for more information check CP 3284 on handy form, pages 2 and 3.

# \$30,000 back in 5 years

The 500-kw, 250-volt G-E rectifier at the Florence Pipe Foundry and Machine Company requires only periodic inspection.



The G-E rectifier provides the d-c power which operates the cranes, ladles, and centrifugal casting machinery in the Florence Company's plant.

## Florence Pipe Foundry & Machine Company

### GETS LOW-COST D-C POWER WITH G-E RECTIFIERS

When the Florence Pipe Foundry & Machine Company needed additional d-c power in 1946, George E. Pfeffer, electrical engineer, looked for the best way to do the job. He learned that installing G-E rectifiers would save in three ways:

#### 1. Installation costs—\$10,000 less

The rectifiers were compact enough to fit into the present power house. Other types of generating equipment required the construction of a costly new building.

#### 2. Operating costs—no new personnel needed

Because rectifiers need only periodic inspection, there's no need for standby personnel.

#### 3. Power costs—\$600 a year less

The extra high efficiency of G-E sealed rectifiers saves about \$600 a year in power bills.

The combined savings will amount to \$30,000 in five years. That will pay for the rectifiers, and for the cost of installing them.

#### To Cut your Power Costs

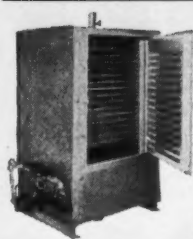
Find out today how you can put G-E power rectifiers to work in your plant. Call or write your nearest G-E sales office for information. Apparatus Department, General Electric Company, Schenectady, N. Y.

G-E MERCURY-ARC RECTIFIERS MEAN LOW-COST D-C POWER

GENERAL  ELECTRIC

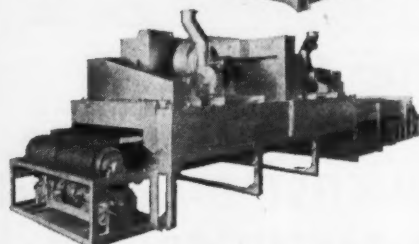
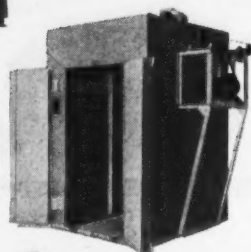
When inquiring check CP 3285 on handy form, pgs. 2-3

None Compares with



Standard gas-fired cabinet oven, with special slotted door for removal of individual trays as required.

Standard electric, gas, oil or steam heated oven for work loaded on racks or trucks; 18 sizes.



Double belt conveyor electric oven for drying chemicals, pharmaceuticals, glass vials, etc.

## GEHNRICH Recirculating OVENS

In

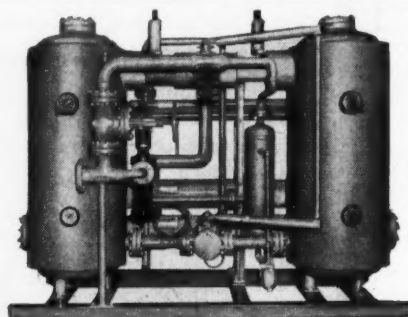
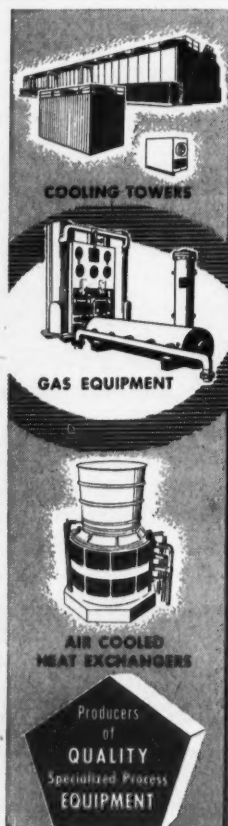
- ✓ Drying Uniformity
- ✓ Efficiency
- ✓ Operating Safety

Whatever your baking, drying or curing process, Gehnrich Ovens are available in a wide variety of types and sizes with internal or external fuel or electric heating systems and with Gehnrich exclusive cross-flow heat recirculation.

They are equipped with auxiliary equipment for close control of temperature, heating uniformity and ventilation and with automatic protective devices for safety shut-off in event of fuel or power failure. Write for our Oven Catalog.

Gehnrich Oven Division  
**W. S. ROCKWELL CO.**  
220 Eliot Street • Fairfield, Conn.

When inquiring check CP 3286 on handy form, pgs. 2-3



## Install the New Pritchard HYDRYER\*...

...for Dependable Dehydration  
of Air and other Gases

Unexcelled for efficiency in drying air for instrument and process controls. Pritchard HYDRYERS are standard packaged units designed to reduce dew points of compressed air and other gases to minus (-) 40° F. Only service connections are required. Specially designed HYDRYER\* units can be built to your requirements.

Write for FREE Bulletin No. 16.0.080

\*Registered Trade Name

EQUIPMENT DIVISION  
**J.E. Pritchard & Co.**  
Dept. No. 68 908 Grand Ave., Kansas City 6, Mo.

District Offices:  
HOUSTON • ST. LOUIS • CHICAGO • PITTSBURGH • TULSA • NEW YORK  
Other Representatives in Principal Cities from Coast to Coast.

When inquiring check CP 3287 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

**Discharge extinguishing spray from 1 qt gun; smother small liquid, electrical fires . . .**

can be operated with one hand and recharged in a few seconds

**Uses:** For class B and C fires in electrical equipment, motors, and other small oil and grease blazes.

**Features:** Aims and operates like a gun with trigger-quick action. No pumping is required. Easily recharged and pressurized with any standard air chuck or an ordinary tire pump. Can be operated with one hand. Will not freeze.

**Description:** One quart capacity. Stored pressure of from 125 to 175 psi at 70°F discharge extinguishing fluid a distance of 25 to 30'. Discharge time is 35 seconds at 70°F. Unit will resist a minimum bursting pressure of 900 psi. Shell is drawn brass with convex ribbed bottom. Conveying handle is designed so that it can be stowed, making it compact.

Protection against tampering is provided by a soft metal sealing wire and lead seal from the filler cap to handle which must be broken before the extinguisher can be discharged. Pressure gauge has reading from 0-300 psi. Weight of fully charged unit is approximately 6 lb, 6 oz. Length is 14-1/8". Underwriters' ratings: B-2 and C-2.

**Source:** One-quart pressurized Fire-Gun is made by American-LaFrance-Foamite Corp., Dept. CP, Elmira, N. Y. . . . for more information check CP 3288 on handy form, pages 2 and 3.

## Shows 3000 and 4000 lb fork trucks

Eight-page, 2-color bulletin describes and illustrates the design and construction features of fork trucks with capacities of 3000 and 4000 pounds.

Bulletin contains: 1) pictures and descriptions of major components of the trucks; 2) dimension drawings showing maneuverability; 3) detailed specifications; 4) pictures and descriptions of features that lend ease of handling and maintenance; 5) pictures of these trucks working in 8 different industries and 16 different applications; and 6) illustrations of 14 accessory attachments that extend the applications of these trucks.

Bulletin 1324 is issued by Baker Industrial Truck Div., The Baker-Raulang Company, Dept. CP, 1250 W. 80th St., Cleveland 2, O. When inquiring specify CP 3289 on handy form, pages 2 and 3.

## AIR-POWERED IMPACTOOL

pays for itself  
in  
**1½ hours use!**



• A chemical plant had to loosen and tighten 2½" electrode clamp bolts on a phosphate furnace every 4 hours. The job was done previously in 12 minutes by 3 or 4 men with a ten foot open-end wrench. Now a large Impactool, suspended for 1 man operation, does the job in 3 minutes.

Through reduced furnace down time, labor savings, and material savings (no longer necessary to burn or cut off "frozen" brass nuts) the company reports that the Impactool, costing \$700, paid for itself in 1½ hours of use.

Ideal for use on equipment where corroded, frozen, or rusted nuts must be removed and driven up tightly, Impactools are available in a complete range of sizes to handle everything from the smallest nut up to a 4" diameter bolt-size nut! Call, wire, or write your Ingersoll-Rand branch office today for complete information and a convincing demonstration in your own plant, on your own jobs.

**Ingersoll-Rand**  
11 Broadway, New York 4, N. Y.

504-8

When inquiring check CP 3290 on handy form, pgs. 2-3



**IMMEDIATE  
DELIVERY**

on Pyrex  
**HEAT RESISTANT  
SIGHT GLASSES**

Now you can get Sight Glasses without delay cut or ground in any shape from PYREX Heat Resistant Polished Plate Glass—for use on ovens, absorption columns, evaporators, stills, pressure vessels—wherever heat resistant glass is desirable.

These heat-resistant Sight Glasses resist clouding and pitting, as well as all chemicals except HF and strong, hot caustic solutions. Special cutting and grinding equipment enables Swift to supply Sight Glasses in rounds, squares, rectangles, odd shapes in 8 different thicknesses, from 1/8" to 1" and in any size that can be made from a 24" x 60" plate. Write, wire, phone for quotations. Bulletin on request.

**SWIFT LUBRICATOR CO., INC.**

31 West 14th Street • Elmira, New York

When inquiring check CP 3291 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## PROCESSING EQUIPMENT

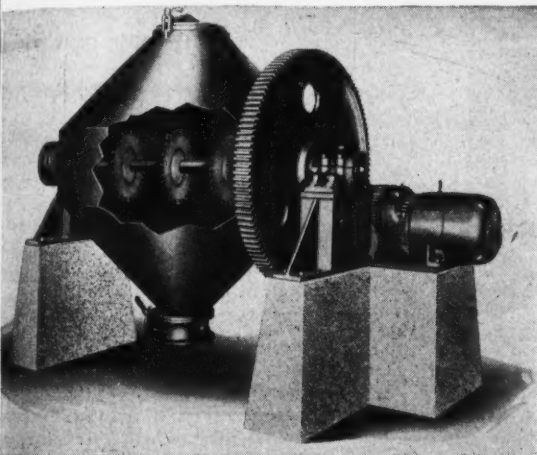
### Avoid agglomerate formation by blending materials in disintegrating unit . . .

efficiently mixes chemicals, pigments, drugs containing small amounts of moisture

**Uses:** For efficient mixing of chemicals, pigments, powdered metals, resins, drugs, and similar products.

**Features:** Successfully handles materials containing small amounts of moisture, particularly when characterized by small particle size, and which may form agglomerates during the mixing cycle.

**Description:** Blender is equipped with disintegrating elements mounting on a shaft extending through the blend-



Disintegrating elements break up agglomerates

er trunion. These elements, rotating at high speed and in counter rotation to the blender proper, break up agglomerates that are formed without reducing particle size. The blender is produced in sizes having operating capacities of 35 to 550 cu ft and is available in mild steel or alloys as required.

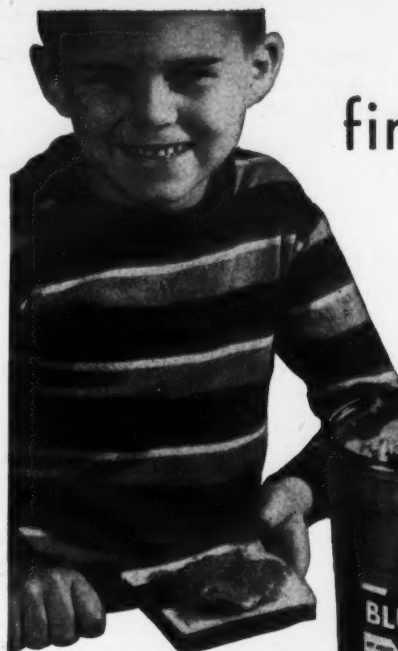
**Source:** Patterson Foundry & Machine Co., Dept. CP, East Liverpool, Ohio . . . or for more information check CP 3292 on handy form, pages 2 and 3.

### Tells use of stainless steel in the paper industry

Twelve-page, 2-color booklet tells how stainless steel equipment eliminates corrosion problems, lowers maintenance costs, and improves stock quality in the paper industry. Also included are practical suggestions for operation and care of stainless steel equipment.

Besides pointing out the advantages of stainless steel in many phases of paper making, booklet contains 2 pages of test data showing the comparative corrosion resistance in actual mill service of mild steel and several grades of stainless. Case histories show where use of stainless steel has been effective in pulp and paper mills to lower costs. Flow sheets and a section on suitable grades show where stainless steel can be used to advantage in mill and finishing equipment.

**Description** of extra-low-carbon stainless steels that conserve critical alloying elements is included, as well as data on precipitation hardening grades. "Stainless Profit Story for the Paper Industry" is issued by Armco Steel Corporation, Dept. CP, Middletown, O. When inquiring specify CP 3293 on handy form, pages 2 and 3.



fine-flavor formulas call for  
*modern processing*

..AT BLUE PLATE FOODS, INC.



IT'S NO ACCIDENT that Southern housewives buy so many Blue Plate foods.

Fine ingredients for Blue Plate margarine, salad dressing, and peanut butter are processed on a continuous basis by Girdler's VOTATOR Processing Apparatus. Appealing fresh flavor and purity are safeguarded in the completely enclosed system.

"Blue Plate" achieves economy in manufacturing too. VOTATOR Apparatus chills, congeals, and plasticizes materials like margarine *six to ten times faster* than any other known heat-exchange mechanism. With this efficiency, and automatic operation, Blue Plate Foods has made substantial savings in labor costs, time, and space.

If you process any liquid or viscous material involving heat exchange, in-

VOTATOR—T. M. Reg. U. S. Pat. Off.

vestigate VOTATOR Processing Apparatus now. With it you can expect greater processing economy and rigid quality control.

### Write for Free Book



This 32-page book gives you the complete story on VOTATOR Processing Apparatus. Describes the processing of an amazing variety of liquid and viscous materials for food and industrial use. Contains 12-page technical section with valuable reference data and charts. Write for your free copy today. The Girdler Corporation, Votator Division, Louisville 1, Kentucky.



VOTATOR MARGARINE PROCESSING UNIT

# GIRDLER

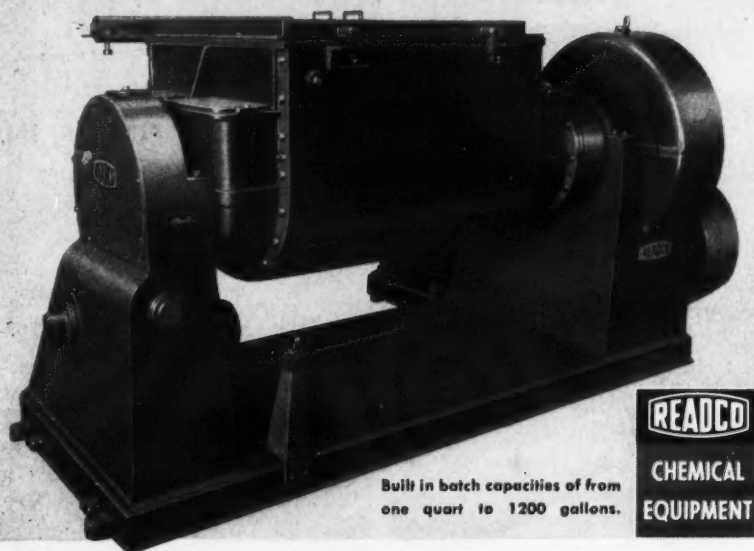
**CORPORATION**

Votator Division

When inquiring check CP 3294 on handy form, pgs. 2-3

# OVERLAPPING ACTION

designed for thorough—  
fast mixing



Built in batch capacities of from  
one quart to 1200 gallons.

**READCO**  
CHEMICAL  
EQUIPMENT

**T**HE OVERLAPPING arm action of Readco Double Arm Mixers exposes new surfaces and breaks down the entire mass with each rotation. It produces a homogeneous mass in a short mixing cycle. Cylinders of material cannot form around the arms. Peak loads are eliminated.

Close clearances between mixer arms and shell provide better heat transfer and thorough mixing.

All gears operate in oil, assuring positive lubrication at all times.

Readco Double Arm Mixers feature: anti-friction bearings, adjustable bowl covers, single packing gland construction, easily removed split seals.

Options: Vacuum or non-vacuum, jacketed or non-jacketed design... single, multi-speed, or variable-speed drives... tilting bowl or bottom discharge... construction of carbon steel, stainless steel, or any commercial alloy.

**READ**

**READ MACHINERY DIVISION**  
of The Standard Stoker Company, Inc.

Main Office and Plant: YORK, PENNSYLVANIA

Standard Stoker Plant  
ERIE, PENNSYLVANIA

Booth Plant  
LOS ANGELES, CALIFORNIA

When inquiring check CP 3295 on handy form, pgs. 2-3

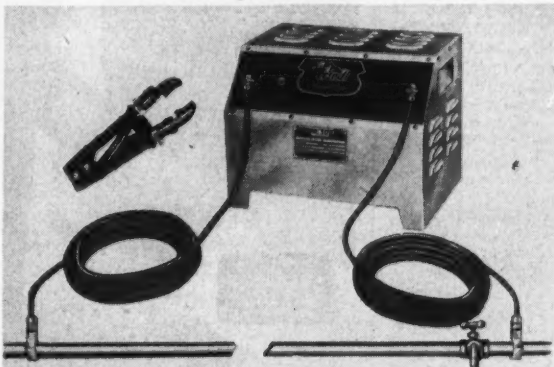
## PROCESSING EQUIPMENT

**Heat non-inflammable liquids  
in process lines, thaw pipes,  
solder with one unit . . .**

compact cabinet unit plugs into 110-220 outlet;  
secondary output cable is clamped to pipes

**Uses:** Originally designed to thaw frozen water pipes, unit can be used to heat pipes carrying liquids through process lines as well as in many applications involving free flow of liquids. By means of recently developed attachments, the equipment may be used for soldering and brazing.

**Features:** Easy to apply to pipes or operate as solder-in unit. Delivered complete, ready-to-use upon plugging



Pipe heating-thawing unit has soldering attachment

into any 110-220 volt 50-60 cycle outlet. Operation involves no fire hazards. The equipment is effective on underground and imbedded pipes.

**Description:** Pipe thawer and soldering unit embodies "Therm-o-tron" cabinet, heavy secondary output cable, power cord and plug, two heat control taps arranged for 200-500 amps. Each tap automatically regulates the proper amount of current and voltage required for the various sizes and lengths of pipe.

Complete unit with cords, clamps and all supplies weighs 75 lb. Cabinet dimensions are: height 10½", width 15½", depth 10½".

**Source:** "Therm-o-tron" units are built by Trindl Products, Ltd., Dept. CP, 17 East 23rd St., Chicago, Ill. . . or for more information check CP 3296 on handy form, pages 2 and 3.

**Easily attached to conveyor,  
marker dates or codes  
passing packages . . .**

models are for spot-printing or continuous printing

**Uses:** Attached to conveyor line, marker automatically dates, codes or otherwise marks production runs of cartons and other packages.

**Features:** Easily attached to conveyor, packaging or sealing machine, or work table.

**Description:** Friction between marker and moving carton or package will do necessary imprinting. The marker will automatically spot-print legend. In operation, the printing drum turns immediately one-half revolution or less, to a positive stop, and is then ready to repeat the cycle. There is no oscillation of the printing drum. The device uses interchangeable rubber type. Inking is accomplished by means of a felt roller that has an internal reservoir for ink. Three models are made for use on cartons 7 to 14" long.

Would you like  
to receive  
**CHEMICAL  
PROCESSING**  
personally?

It will be sent to you  
without charge or  
obligation . . .

. . . if you qualify  
. . . if you request it

If you are responsible for processing operations in an administrative capacity as plant superintendent, chemical engineer, chemist, engineer or equivalent responsibility . . . in a plant of substantial operations where chemical processing is an important factor . . . **CHEMICAL PROCESSING** will be sent to you without charge or obligation if you request it. Use form below. In requesting, be sure to answer all questions. If your firm is not rated or listed in standard references, indicate size of the company by capacity, annual sales or number of employees. Unless all information is given, magazine will not be sent.

\*"Substantial operations" does not necessarily mean an extremely large plant. But requests for the magazine exceed supply so we must set standards to insure publication being sent where it can be used to best advantage.

**CHEMICAL PROCESSING**  
737 N. MICHIGAN AVE.  
CHICAGO 11, ILLINOIS

Please send me **CHEMICAL PROCESSING** without charge or obligation

Name

Title

Company

Rating of Company

Street

City

Zone

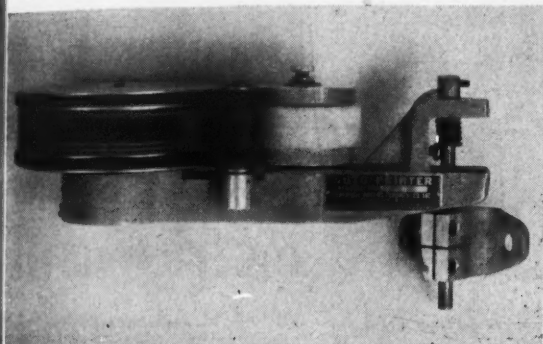
State

Main Products

**CHEMICAL PROCESSING**

## PROCESSING EQUIPMENT

maximum size of imprint being 3 x 9". Three other models are offered for cartons 10 to 24" long, maximum imprint size in this case being 3 x 14". In addition to



Marker for attachment to conveyor lines

these six models for spot-printing, seven are available for continuous printing on any length carton. Maximum size of imprint here is 3 x 18".

**Source:** Auto-Printer, "Whippet" marker is a product of The Industrial Marking Equipment Co. Inc., Dept. CP, 7 E. 48th St., New York 17, N. Y. . . or for more information check CP 3297 on handy form, pages 2 and 3.

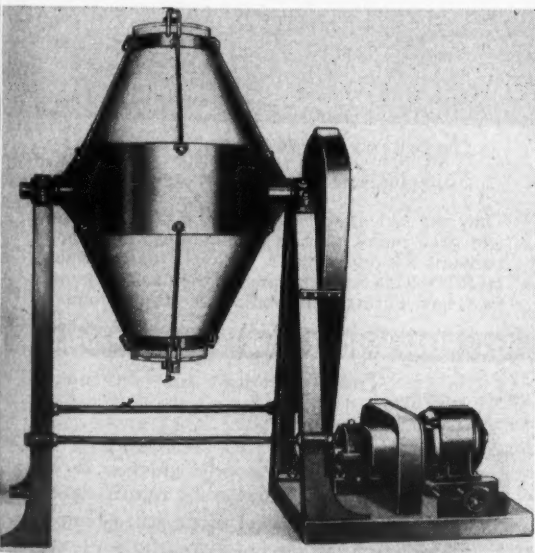
### For blending materials that cannot contact metal . . .

first time an all-porcelain blender has been offered, manufacturer reports

**Uses:** Conical-type blender for processing materials that cannot be brought into contact with metal.

**Features:** Maker reports that to the best of his knowledge this is the first time an all-porcelain blender has been offered.

**Description:** Porcelain cone of the blender holds 56



Capacity of all-porcelain blender is 56 gallons. Inside diameter at the widest point is 24 1/4", and inside length is 46-3/4".

**Source:** Development of Paul O. Abbe, Inc., Dept. CP, Little Falls, N. J. . . or for more information check CP 3298 on handy form, pages 2 and 3.

# 1,000,000 FINGERS\*

that will  
work forever

They're specialized fingers that work only on the separation of magnetic substances — they keep iron out of substances in process . . . protect machinery against damage . . . prevent fires and explosions caused by iron sparks . . . they catch iron on the fly and hold it fast!

ONE MILLION fingers able and willing to do a *real* iron removal job. It's the DINGS PERMA-PLATE MAGNET and its cost is very low. Think . . . how many places can you take advantage of a labor force like this! This force will work for you forever because the Perma-Plate is NON-ELECTRIC, guaranteed PERMANENT.

**Other Qualifications:**

The Perma-Plate Magnet handles solids or liquids, withstands high temperatures, and can be installed anywhere. Its magnetic strength is *certified*. There is a size and strength ideal for any job you have in mind. Get details now.

\*That's the approximate number of lines of force emanating from the surface of a Dings Type II 30" wide Perma-Plate Magnet.

Send for  
the Perma-Plate  
Catalog, IT'S  
THE MODERN  
WAY TO SEPA-  
RATE IRON,  
Today.



**DINGS MAGNETIC SEPARATOR CO.**  
4731 W. Electric Ave., Milwaukee 16, Wis.

*World's Largest Exclusive Builders of Electric  
and Non-Electric Tramp Iron Magnets*



When inquiring check CP 3299 on handy form, pgs. 2-3

## A NEW Member...

Yes, a new member to the old family of StaSafe protective garments . . .

### StaSafe Black Neoprene

Designed to give you low cost worker comfort and protection in the dirtiest, muckiest of jobs.

- Chemical Resistant
- Sealed Seam
- Protective Frontal Flap
- Sturdy Snap Buttons
- Raglan Sleeves
- Two-piece for more versatility

Truly a garment of many uses —

Write today for Bulletin No. 505 containing complete information!

GRA-LITE — MAROON — AIRLITE — BLACK NEOPRENE

## STANDARD SAFETY EQUIPMENT CO.

232 West Ontario Street — Chicago 10, Illinois

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Cleveland 5, Ohio  
2029 E. 102nd St.

When inquiring check CP 3300 on handy form, pgs. 2-3

**DOWNINGTOWN IRON WORKS, INC.**  
DOWNINGTOWN, PA.  
STEEL & ALLOY PLATE FABRICATION  
HEAT EXCHANGERS

## What's in a NAME?

The present management of DOWNINGTOWN IRON WORKS, INC., started out over 37 years ago, to attain and maintain the reputation of "doing one thing well"; i.e., Steel Plate Fabrication, and they have never varied. DOWNINGTOWN takes justifiable pride in knowing that through these years, they have never once sacrificed *quality* for price. The many developments in the variety of metals, and methods of fabricating these metals, have made our work most interesting and, we like to feel that we have contributed, in a small way, to advancing the economy of our Country. DOWNINGTOWN would like to work for you and with you. Our facilities include the finest of plant equipment, skill and "know-how". We are strategically located on the main line of the Pennsylvania Railroad, with important cities and towns and steel-producing centers being close-by. DOWNINGTOWN also maintains a Heat Transfer Division under the direction and supervision of men thoroughly trained and experienced in this field.

May we be of help to you? Useful literature will be gladly sent upon request on your Business Letterhead.

**DOWNINGTOWN IRON WORKS, INC.**  
DOWNINGTOWN, PA.

NEW YORK OFFICE, 30 CHURCH STREET

When inquiring check CP 3301 on handy form, pgs. 2-3



## PROCESSING EQUIPMENT

**Germ-killing action without irritation is 'bult' into powdered soap . . .**

hand cleanser contains effective destroyer of harmful bacteria

**Uses:** Every-day washing of hands in processing plants. Aids in control of industrial dermatitis and infections.

**Features:** Unlike ordinary powdered hand soaps, Formula #99 actually destroys harmful bacteria that are the source of skin infections. Contains a fine vegetable scrubber that will not scratch or irritate the skin or cling to cuticles. Will not clog drains; does not contain corn meal or sawdust.

**Description:** The powdered soap contains the same percentage of the antiseptic hexachlorophene as manufacturer's "Dial" bar soap. It also has the same soap base. It lathers quickly, rinses freely, and cleans effectively in hot or cold, soft or moderately hard water. Dry, uniform and free-flowing, the soap possesses an agreeable odor.

Actual tests in plants show that the powdered soap provides excellent control of industrial dermatitis without causing irritations. Best results are secured by every-day use of the soap. The antiseptic evidently is absorbed into skin surface and has a residual effect.

**Source:** Formula #99 antiseptic powdered hand soap is a development of Industrial Soap Division, Armour and Company, Dept. CP, 1355 W. 31st St., Chicago 9, Ill. . . or for more information check CP 3302 on handy form, pages 2 and 3.

**Improved hand cleaner contains lecithin . . .**

reduces skin irritations due to repeated washing

**Uses:** Powdered hand cleaner for removing industrial soils. For warm or cold water.

**Features:** Improved form includes lecithin, a soap-intensifying emollient said to enhance detergency and stabilize "sudsing".

This is in addition to a relatively high percentage of "free" lanolin. No gritty abrasives or irritating caustics.

**Description:** A free-flowing, non-dusting powdered cleaner. Fine-grain cornmeal particles act as carrier for emollients and give sponge-like action. "Lan-O-Kleen."

**Source:** West Disinfecting Co., Dept. CP, 42-16 West St., Long Island City 1, N. Y. . . or for more information check CP 3303 on handy form, pages 2 and 3.



**BUILT FOR  
DURABLE SERVICE**

in plant or lab!

**STAINLESS STEEL  
and MONEL  
UTENSILS**

by  
**METALSMITHS**

Everything you need for  
corrosion-resistant  
service!

Pails, measures, funnels, dip-  
pers, beakers, scoops, batch  
cans, dye and starch buckets,  
stock pots, shovels. Wide  
range of sizes.

METALSMITHS utensils are real  
production equipment—built to the  
exacting needs of corrosion-resis-  
tant service. Efficiently designed  
—made of correct metal analysis  
and weight—fabricated by latest  
techniques—backed by over 25  
years' specialization in corrosion-  
resistant equipment for the process  
industries.

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**METALSMITHS**

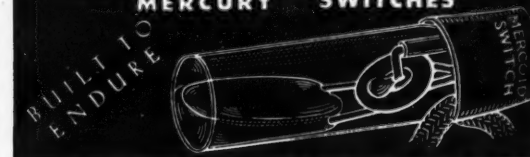
Division of Orange Roller Bearing Co., Inc.

556 White Street

Orange, N. J.

When inquiring check CP 3304 on handy form, pgs. 2-3

**MERCOID**  
MERCURY SWITCHES



**Universally Known for Their  
Superior Quality and Workmanship**

They are not affected by dust, dirt or corrosion  
and have many definite applications where open  
contacts are not suitable. Various types available.  
MERCROID is your guarantee of the best in mercury  
switches. Further information sent upon request.

LET MERCROID SOLVE YOUR CONTROL PROBLEMS



They rank first for convenience  
of adjustment—dependable  
service and long life.

They are designed for various  
applications requiring the  
control of pressure, temper-  
ature, liquid level and  
mechanical operation.

Complete Mercoid Catalog sent upon request.

THE MERCROID CORPORATION, 4201 BELMONT AVE., CHICAGO 41, ILL.

When inquiring check CP 3305 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## PROCESSING EQUIPMENT

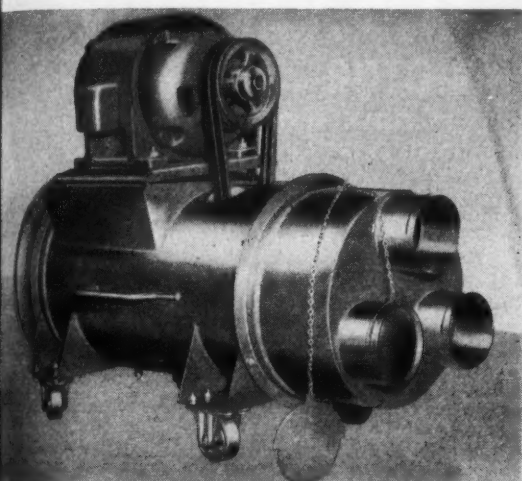
Three air outlets of blower can be used in combination or singly as needed . . .

full air delivery can be concentrated in one tank, or 3 compartments can be blown out simultaneously

**Uses:** Specially designed application of maker's standard 12" vaneaxial blower, developed primarily to expel explosive fumes from gasoline tank cars and trucks before interior repair welding is done.

**Features:** End assembly is built with 3 air outlets, with shut-off gates, so that 1, 2, or all 3 can be used at the same time. Thus full air delivery can be concentrated in one large tank, or up to 3 smaller compartments can be blown out simultaneously.

**Description:** Each outlet delivers approximately 500 cfm of air through 15' of 5" hose with a right-angle bend. End assemblies can be quickly and easily reversed to pull in air, if desired. Blower comes as complete, self-contained



Three air outlets lend flexibility to blower

unit, with built-in motor to suit available power supply. Air delivery hose of any length is furnished. Compact, light in weight, and flexible, blower is mounted on industrial casters for mobility.

**Source:** Mobile vaneaxial blower is made by Hartzell Propeller Fan Company, Dept. CP, Piqua, O. . . or for more information check CP 3306 on handy form, pages 2 and 3.

### Control functions possible from strip chart recorder

Line of electronically operated strip chart recorders is described and illustrated in 2-color, 4-page bulletin. Measurement may be obtained with any type of primary element producing an electrical impulse — thermocouples, radiation detectors, resistance bulbs, etc. Recorder can be used for such variables as temperature, speed, static strain loads, AC or DC voltage, and amperage.

In addition to explaining how direct deflection, Wheatstone bridge circuit, and pneumatic control types of operating systems are applied to this line, the bulletin lists model numbers and specifications of various recorders and recorder-controllers. Bulletin C2-2 is issued by Wheelco Instruments Company, Dept. CP, 847 W. Harrison St., Chicago 7, Ill. When inquiring specify CP 3307 on handy form, pages 2 and 3.

# where corrosion hits hardest...



a team of **DURCO** alloys

**fights it to a standstill**

Why does industry consistently come to The Duriron Company with its toughest corrosion problems? A major reason is the wide range of alloys in which DURCO equipment is supplied. DURCO equipment is made in as many as 8 standard alloys . . . and our foundry produces more than 20 different compositions every month.

Why so many?

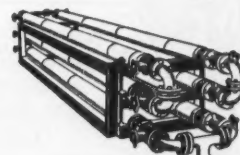
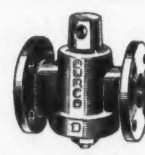
Because the destructive effects of corrosive agents used by industry vary with the agents themselves and

with the conditions under which they are used. To be fully effective, the alloy must fit the prevailing conditions as well as the corrosive material.

In grappling with corrosive problems for nearly 40 years, DURCO has developed the largest team of alloys ever produced by a single company. That team is always available to industry, together with the technical experience that produced it.

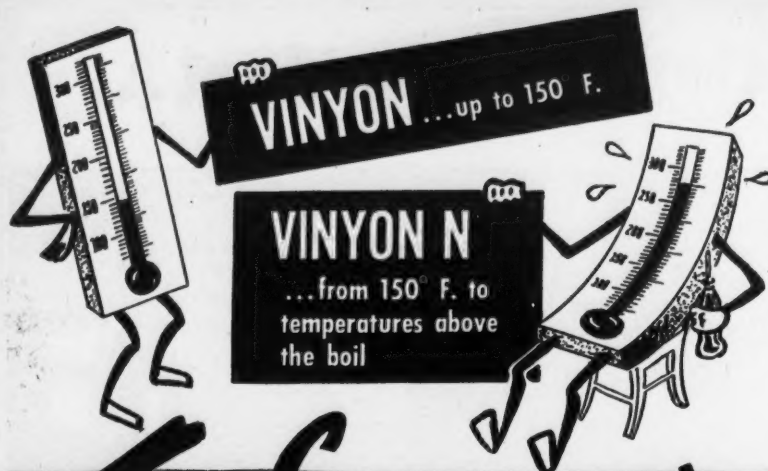
Write, wire or call for information.

The Duriron Company, Inc., Dayton, Ohio



DURCO products include PUMPS, VALVES, STEAM JETS, HEAT EXCHANGERS

When inquiring check CP 3308 on handy form, pgs. 2-3



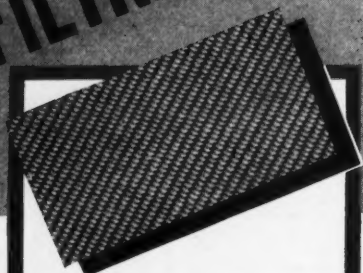
# Tops for broad-range CHEMICAL FILTRATION

NFM VINYON† and VINYON N† are excellent general purpose filter cloths. They are available in a variety of weaves and in any desired standard width from 26" through 72" or as made up filter element covers.

Over Forty Years of weaving experience have given us the "know how" so necessary to the production of top quality Industrial Filtering Fabrics. We weave all of our Synthetic Fiber Cloth including Glass, Nylon, ORLON\* (an acrylic fiber cloth), Saran, VINYON†, and VINYON N†.

Write us about your requirements, we'll be glad to send test cloths, if you are not sure which cloth material is best.

†TM—E. I. duPont de Nemours  
\*TM—UCC



"Excellent Resistance—No Attack" are the operating reports when these filter cloths are used for filtering:

## ACIDS

SULPHURIC  
HYDROCHLORIC  
NITRIC  
HYDROFLUORIC  
AQUA REGIA

## CAUSTICS

SODIUM HYDROXIDE  
POTASSIUM HYDROXIDE

and

CHLORINE or BROMINE WATER  
SILVER NITRATE  
TANNIC ACID  
MANY OILS, FATS and WAXES



General Offices & Mills: New Haven 14, Conn.  
Western Office & Factory: Salt Lake City 1, Utah

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Chicago, Ill. Cincinnati, Ohio Houston, Texas Oslo, Norway Johannesburg, South Africa  
2627 West 19th St. Roselawn Center Bldg. 1406 Second National Bank Bldg. Nicolai Frills Edward L. Bateman

When inquiring check CP 3309 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

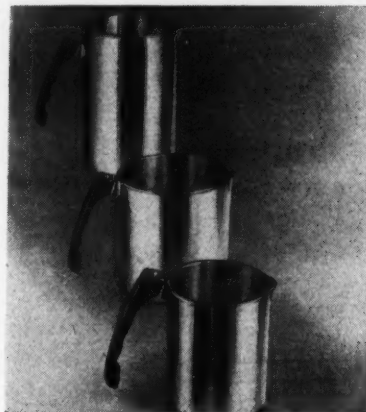
**Bakelite handles, dripless pouring lips features of stainless beakers . . .**

beaded top rims add strength as well as rigidity

**Uses:** Stainless steel beakers for laboratory applications.

**Features:** Permanently attached Bakelite handles and dripless pouring lips assure safety in use. Beaded top rim adds strength and rigidity to beakers.

**Description:** Three convenient laboratory sizes are offered: 1000, 2000,



Stainless steel beaker line

and 3000 ml with inside diameters of 4-1/8, 5-1/4, 5-1/4", and heights of 5-1/2, 6, and 8-1/2" respectively. All are heavy gauge 18-8 stainless steel.

**Source:** Products of the Meyer Scientific Supply Company, Inc., Dept. CP, 221 Atlantic Ave., Brooklyn 2, N. Y. . . or for more information check CP 3310 on handy form, pages 2 and 3.

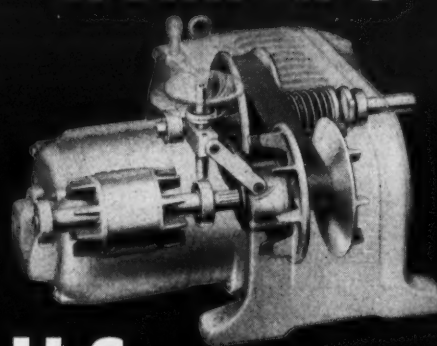
## Testimonials laud viscosity tester

Many testimonials from users of standard instrument for viscosity testing are contained in 4-page "What Users Say. . .", issued by Brookfield Engineering Laboratories, Inc., Dept. CP, Stoughton, Mass. When inquiring specify CP 3311 on handy form, pages 2 and 3.

## Preparing stainless steel for hardening process

Containing much data and photographs, "Methods to be Used in the Preparation of Stainless Steel for Hardening" is issued by C.U. Scott & Son, Inc., Dept. CP, Rock Island, Ill. When inquiring specify CP 3312 on handy form, pages 2 and 3.

# GET 10 HOURS WORK IN 8



## U.S. VARIDRIVE MOTOR — 1 to 10,000 R.P.M.

PRECISELY THE RIGHT SPEED FOR EACH  
AND EVERY OPERATION INSTANTLY

Ask for Descriptive Bulletin

U.S. ELECTRICAL MOTORS, Inc.  
Los Angeles 54, Calif. Milford, Conn.

When inquiring check CP 3313 on handy form, pgs. 2-3

## EVERY ARTICLE IN CHEMICAL PROCESSING IS "STAFF WRITTEN"

Every article in CHEMICAL PROCESSING is terse, brief, to-the-point . . yet packed with essential facts of developments important to every man in chemical processing.

For every article is "Staff Written." Our Editors dig out the vital news-facts, then write them in the fewest possible words. That's why you read so much . . keep up with developments . . in short reading time. You don't have to "wade through" long, hard-to-read articles.

That's why you don't find these articles signed . . every one is "Staff Written." It's the most difficult kind of editing, but it pays big dividends to every busy reader.

## PROCESSING EQUIPMENT

### Conquers fires by smothering, cooling materials below vaporization points . . .

nozzle produces water-fog consisting of extremely small particles of water of uniform size

**Uses:** Nozzles are water-fog producing devices for fixed-piping fire protection systems. Suitable for automatic or manual control, or both. Maker reports nozzles have proven highly efficient for extinguishment of fires involving oils (oil-filled electrical equipment for example), various chemical components, gasoline, etc. UL-listed for Class "B" and "C" fires.

**Features:** Extremely small water particles of uniform size produced by the nozzles are responsible for efficiently cooling burning materials below their vaporization points and thus extinguishing fires.

Where certain volatiles cannot be cooled below their vaporization points by water fog, as in the case of gasoline, oxygen must be excluded. This is accomplished as the water particles are drawn into the vortex of the burning material, entrained with the air, and are converted to a gas by heat. Tremendous volumetric expansion (ratio of 1700 to 1) excludes oxygen from the gas-vapor area, the mixture becomes too rich to burn, and thus the fire is smothered.

**Description:** "Foghed" nozzles make use of jet-impinging orifices for breaking water into extremely small particles with uniform size.

**Source:** Manufactured by Fog Nozzle International Division of Akron Brass Mfg. Co., Inc., Dept. CP, Wooster, O. . . . or for more information check CP 3314 on handy form, pages 2 and 3.

### Extensive uses attributed to plastic pipe "family"

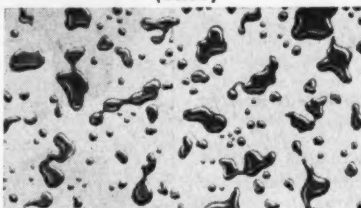
Characteristics and applications for a series of plastic pipe and tubing are reported in a group of descriptive bulletins and folders. All members of this plastic "family" have many common characteristics — light weight . . . resistance to electrolytic corrosion, rot, and rust . . . as much flexibility as desired — but individual members have varying properties that suit them to specific uses.

Applications include carrying drinking water, chemicals, gases, brine, sewage, pulps, vapors, dusts, acids, and similar material. Pipe can also be used for electrical applications, such as carrying conduit and wires; the less flexible members can be used as vacuum lines. Plastic pipe literature is issued by The Carter Products Corporation, Dept. CP, 10223 Meech Ave., Cleveland 5, O. When inquiring specify CP 3315 on handy form, pages 2 and 3.

FEBRUARY, 1951



Compare the small uniform-size water particles (above) produced by "Foghed" nozzles with droplets produced by ordinary sprays (below)



400° F.

350° F.

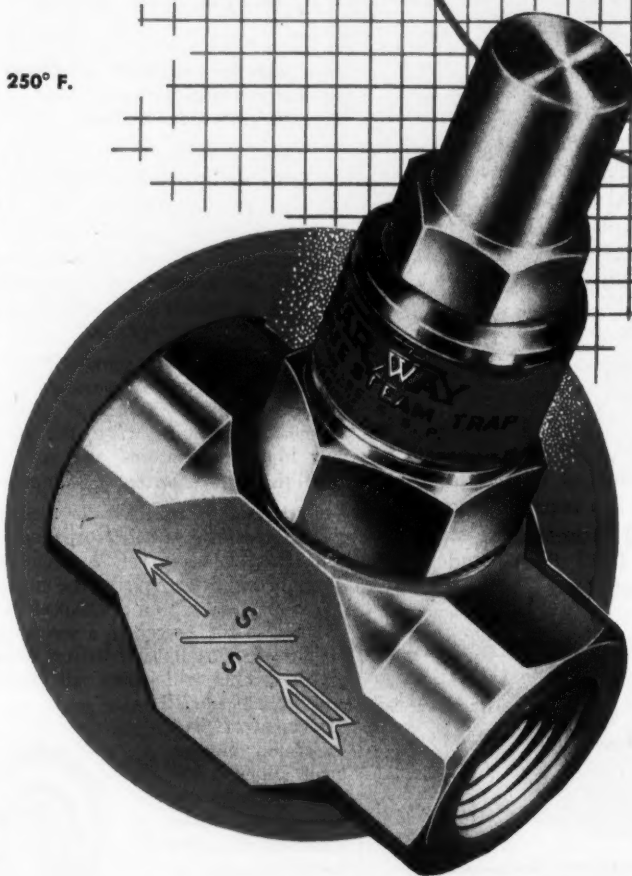
300° F.

250° F.

FOR EVEN TEMPERATURES

# YARWAY

# STEAM TRAPS



Processes requiring careful temperature control call for Yarway Impulse Steam Traps on steam equipment.

The reason! . . . Yarway traps maintain even temperatures because they continually sample and respond to a trickle of the condensate. There is no arrest in flow, no waiting for large quantities of condensate to accumulate, or trapped steam pockets to condense.

Other reasons why Yarway Impulse Traps have become first choice in many thousands of plants:

- They get equipment hotter, sooner
- Small size, light weight
- Easy to install, easy to maintain
- Only one moving part
- Good for all pressures
- Stainless steel construction
- Low cost

If you are not already familiar with these and other advantages of the Yarway Impulse Steam Trap, try one for free and find out for yourself. Call your nearby Yarway distributor, or write to:

**YARNALL-WARING COMPANY**

125 Mermaid Avenue • Philadelphia 18, Pa.

BRANCH OFFICES IN PRINCIPAL CITIES

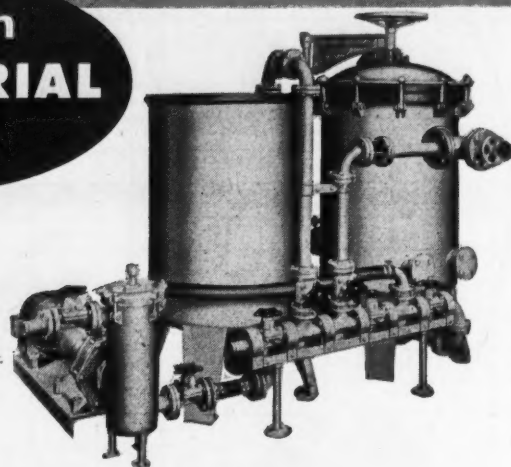
Stainless Steel Body

# YARWAY IMPULSE STEAM TRAP

When inquiring check CP 3316 on handy form, pgs. 2-3

# Solution Clarification? Any Solution-Any Quantity

use an  
**INDUSTRIAL  
Filter**



100 to 15,000 gallons per hour.  
Portable and stationary models.  
Standard or special filtration  
systems engineered to meet  
unusual requirements.

## You save many ways . . .

Here's how Industrial filters keep down filtration costs—The flow rates of Industrial filters are based on the solutions involved. You know the capacity you get. With Industrial you get an adequate filter with slurry tank, motor driven pump, valves and fittings in a complete package with one, undivided, experienced responsibility—with space requirements at a minimum.

The labor, down time, and the inconveniences of cleaning, replacing the filter media, and reassembling the filter for every new filter cycle—all are eliminated by the Industrial Air-Wash Cleaning Method available for all models. It is necessary to remove the cover only when new filter cloths are installed.

The engineering, design, and construction of Industrial filters have proved out in long service and low maintenance costs. Industrial has the experience and is large enough to handle your filter requirements. Since 1927 filters and filtration systems have been an important part of our business.

**INDUSTRIAL  
Water  
Demineralizers**

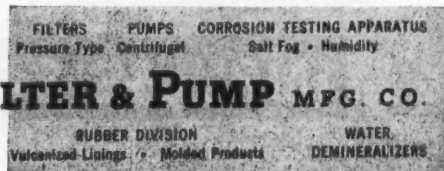
for Chemically pure water at  
a few cents per 1000 gallons.

Write for full information  
and recommendations

**INDUSTRIAL FILTER & PUMP MFG. CO.**

5908 W. Ogden Ave.  
Chicago 50, Illinois

A Two-Bed INDUSTRIAL Water Demineralizer.  
Standard two-and four-bed units available with  
capacities of 200 to 1000 gph. Special units of any  
capacity engineered to requirements.



FILTERS PUMPS CORROSION TESTING APPARATUS  
Pressure Type Centrifugal Salt Fog Humidity

RUBBER DIVISION WATER  
Vulcanized Linings Molded Products DEMINERALIZERS

When inquiring check CP 3317 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

### Covers theories and practices of pharmaceutical emulsions

Practical aspects of emulsions used for pharmaceutical purposes are treated in 132-page book. Theory of emulsification and structure of emulsions in general are also described. Pharmaceutical emulsifying agents are classified as anionic, cationic, and nonionic as well as by source, and are thoroughly investigated. Techniques, apparatus, and causes of failure are all discussed in detail.

Advantages and drawbacks of various emulsifying agent groups are pointed out for special applications, and typical formulas are given. Necessity and use of anti-oxidants and other preservatives are considered. Contents also include detailed alphabetical list of emulsifying agents and other chemicals used in pharmaceutical preparation.

Author is L. M. Spalton. To obtain "Pharmaceutical Emulsions and Emulsifying Agents" remit \$3.75 direct to Chemical Publishing Co., Inc., Dept. CP, 26 Court St., Brooklyn 2, N. Y. When inquiring specify CP 3318 on handy form, pages 2 and 3.

### Iron powder control medium for magnetic clutch provides smooth, powerful action . . .

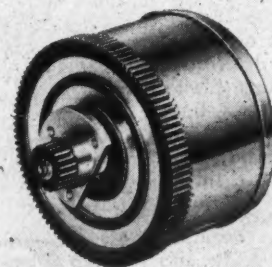
use of powder compound in dry form avoids leakage,  
poor starting at low temperature

**Uses:** Designed for use with servo-actuators (consisting of cumulative compound wound dc motor and reduction gearing). These clutches, as well as more powerful versions, are available as separate torque amplifier units and may be readily adaptable to hydraulic, pneumatic, or other prime mover systems.

**Features:** Extreme smoothness of operation. Since the powdered iron control medium is not mixed with any liquid, there is no problem of leakage or of poor starting at low temperatures. Also, the clutch may be operated at very high temperatures, the safe limit of 250°F being established by the insulating compound used in clutch coils.

**Description:** Iron powder medium is contained within air-gap space between two magnetic surfaces. As clutch coils become energized, a magnetic field is established through the air-gap space; the finely divided particles become magnetized, bind themselves together, and in so doing span the air-gap in a seemingly solid mass. In this fashion the driving and driven members are "linked" together. This eliminates all surface-to-surface contact and the usual axial movement of parts to obtain engagement. Since in normal operation the driving and driven members slip with respect to one another, wear would be expected. However, tests have proved that after hundreds of thousands of cycling operations (more than one million cycles alternately energizing each clutch 1/2 sec 'on', 2 sec 'off' with 40 in-lb load at output pinion) no apparent signs of wear exist.

Because the driving clutch assemblies are continuously revolving, the mass of iron powder mixture is in constant



Magnetic powder clutch

**Catawissa**  
**PERFECT SEAL**  
**Unions**

**HOT FORGED** from solid  
**RECTANGULAR STEEL**  
**BARS** to give you **SURE-**  
**FIRE PIPING DE-**  
**PENDABILITY**

**A TYPE FOR EVERY USE!** **PERFECT SEAL**  
**even with pipe not**  
**in alignment!**



**Standard & Double**  
**Extra Heavy**  
**UNIONS**

Available with  
screwed or socket  
weld ends. 3000-  
lb. sizes 1/8" to 3";  
6000-lb. sizes 1/4"  
to 2".



**ORIFICE**  
**UNIONS**

With screwed or  
socket weld ends.  
3000-lb. and 6000-  
lb. service.

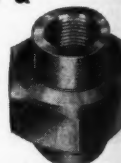
**MALE & FEMALE**  
**UNIONS**

With steel-to-steel,  
bronze-to-steel, stain-  
less steel-to-steel or  
orifice seats. 3000-lb.  
service only.



**FULL STAINLESS &**  
**FULL ALLOY**  
**STEEL UNIONS**

With screwed or  
socket weld ends.  
3000-lb. and 8000-lb.  
service.



**CATAWISSA Ends Guesswork**  
**in Union Requirements!**

**CVF** write for  
**CATALOG 11**  
showing the  
complete  
Catawissa line

**CATAWISSA VALVE AND**  
**FITTINGS COMPANY**  
**620 Mill St. • CATAWISSA, PA.**

When inquiring check CP 3319  
on handy form, pgs. 2-3

**CHEMICAL PROCESSING**

## PROCESSING EQUIPMENT

motion and through centrifugal action is symmetrically distributed throughout the air-gap. These features contribute to the smooth operation of the driven member, and also eliminate any effects due to changing from static to kinetic friction.

Below the point of saturation of the powdered iron, the torque output vs. excitation is a linear function except in the vicinity of zero excitation; by permitting a very small quiescent current to each coil, the torque-excitation relationship may be made linear from zero to maximum operation. Control of these clutch magnetic forces is extremely simple. Generally the few milliamperes required for the coil may be handled by miniature electron tubes.

**Source:** No. 900B-2 clutches are built by Lear, Inc., Dept. CP, 110 Iona Ave., N.W., Grand Rapids 2, Mich. . . or for more information check CP 3320 on handy form, pages 2 and 3.

### Corrosives are carried safely by vinyl tubing . . .

mirror-smooth interior of strong, tough product can be cleaned with ease

**Uses:** Transmission of mineral acids, alkalis, aliphatic hydrocarbons, vegetable or mineral oils, greases, waxes, alcohols and other products.

Can be utilized interchangeably for pressure and vacuum operations, usually without encumbering fittings.

**Features:** High-temperature extrusion anneals the tubing to provide high strength and toughness, yet the compounding process makes the tubing sufficiently elastic so that devices such as clamps and wires are usually unnecessary for union to glass and metal connectors.

Tubing is crystal clear and perfectly odorless. It is permanently stable and non-oxidizing, and is resistant to the materials listed above. It has been proven by pharmaceutical equipment manufacturers to be non-contaminating and non-reactive to even the most sensitive medium. Mirror-smooth interior surfaces are relatively non-wetting, permitting little or no friction loss and facilitating cleaning. Where necessary, the tubing may be chemically or steam sterilized.

**Description:** Cyclon flexible tubing is a specially plasticized vinyl resin formulation that has no opacity or yellowish cast. If desired, however, it can be obtained in different colors. Being thermoplastic, the tubing is not recommended for continuous exposure to temperatures beyond 180°F. It can, however, be used with complete safety at zero temperatures. Although becoming less flexible with cold, there is no brittleness.

Sizes range from 1/64 to 1 1/2" ID. All extrusion dies are interchangeable so that any combination of diameter and wall thickness is possible. At normal temperatures, pressure resistance is dependent on the diameter and wall thickness. As a typical example, Cyclon tubing, 3/16" bore by 3/32" wall has been used in dispensing carbonated beverages at 150 psi without ballooning.

Special formulations such as those having low-temperature flexibility are available. Semi-rigid tubing for electrical conduit and high pressures is also being made. In addition, Cyclon solid cord and channel stripping can be made to order.

**Source:** Maker is Munray Products, Inc., Division of Poly-Cyclo Products Company, Dept. CP, 12500 Crossburn Ave., Cleveland 11, Ohio. . . or for more information check CP 3321 on handy form, pages 2 and 3.

*Now You Can Stop Corrosion*

*with the*  
**Comprehensive**  
**FAMILY**  
*of*  
**PITT CHEM**  
**Protective**  
**Coatings**

- ★ Hot Applied Tar Base Coatings
- ★ Cold Applied Tar Base Coatings—Series 100
- ★ Alkyd Base Coatings—Series 200
- ★ Chlorinated Rubber Base Coatings—Series 300
- ★ Vinyl Base Coatings—Series 400
- ★ Phenolic Base Coatings—Series 500



See Your Nearest Pitt Chem Man

### PROTECTIVE COATINGS DIVISION



**PITTSBURGH**  
**COKE & CHEMICAL CO.**

GRANT BUILDING, PITTSBURGH 19, PA.

Attend the N. A. C. E. Convention in New York City, March 13th to 16th

When inquiring check CP 3322 on handy form, pgs. 2-3



### Protective Coatings Booklet

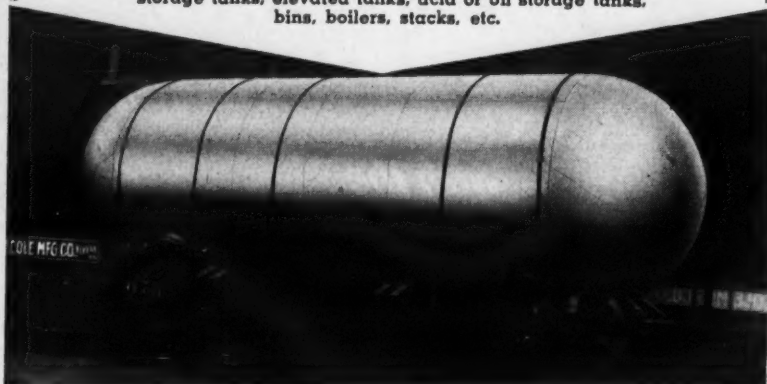
NOW AVAILABLE

Booklet containing specific information on Pitt Chem Protective Coatings will be sent upon request.

W&D 3417 C

## COLE ALUMINUM TANKS

We have available stock sizes from 9,500 to 22,800 gallons for pressure storage, and tanks of 99.6% pure aluminum for hydrogen peroxide from 5000 to 11,150 gallons. "Cole" can furnish tanks made of steel, aluminum and stainless steel — built in accordance with ASME Code — to meet all insurance requirements. We invite your inquiries for high pressure storage tanks, elevated tanks, acid or oil storage tanks, bins, boilers, stacks, etc.



**R. D. COLE MFG. CO.**  
NEWNAN, GA. Established 1854



When inquiring check CP 3324 on handy form, pgs. 2-3

## What's "A New Solution"?

It's an article in **CHEMICAL PROCESSING** describing a new way of solving a tough plant operating problem.

In each issue you will find specific "case histories" showing how these processing problems were solved.

Each article

- ... states the operating problem
- ... explains the process used
- ... gives details of how problem was solved
- ... shows results secured.

Take a look at "New Solutions" articles beginning on page 8 in this issue—they might suggest a "solution" for some of your tough processing problems.

## PROCESSING EQUIPMENT

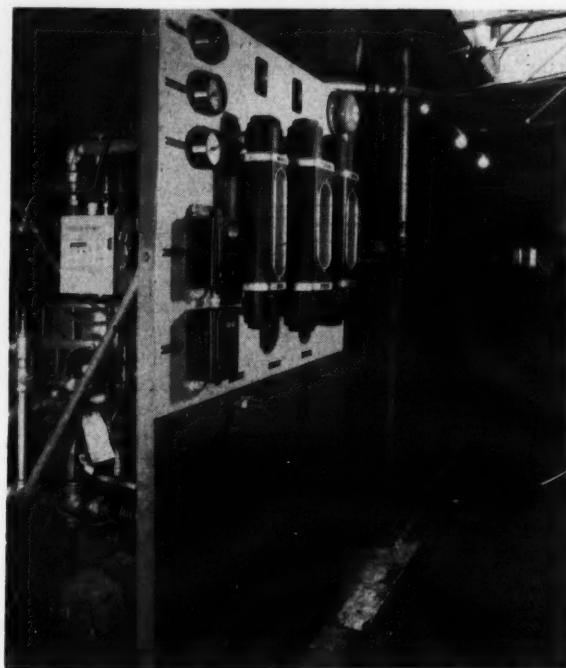
### Continuous emulsification not as space consuming as batch process . . .

emulsifier developed in cooperation with paper industry for emulsification of liquid rosin size

**Uses:** Continuous type emulsifier was developed in close cooperation with the paper industry for the automatic and continuous emulsification of liquid rosin size.

Liquid rosin size is conventionally shipped as 70 or 80% solids, and before addition to the stock system it must be diluted to approximately 4% solids. Emulsification is necessary to disperse the water-insoluble free rosin present in the size so that it will distribute readily in the fibre finish and also floc uniformly with alum to impart ink, lactic acid, and water resistance to the paper. An improperly prepared emulsion may contribute to wet press sticking, felt filling, and non-uniform paper sizing.

**Features:** In contrast with the space-consuming batch type units ordinarily employed for dispersing the thick size by means of severe mechanical action, the continuous type



Continuous, automatic emulsifier

emulsifier takes up no more space than an ordinary office desk (measuring 4' wide x 4' deep x 6' high). Floor space gained through smaller dimensions may in itself pay for many installations in paper mills.

**Description:** Unit can handle up to 12 tank cars of rosin size per month. Dilute emulsion can be supplied as low as 1.5% concentration without need of additional storage facilities.

Close control and accuracy are possible — dilute size is within plus or minus 0.1% of the desired solids content of the emulsion. Emulsifier is designed to operate day-in and day-out.

Safety interlocks have been incorporated in the unit to prevent its being started, or, if running, will shut it down. Float switch located in the dilute storage tank also automatically starts and stops unit.

**Source:** Commercial-scale continuous emulsifier was de-

## Shining Example

This 94 ft. high tower is, in effect, two process columns on the same foundation. It's called a "rich oil contactor-reabsorber". It's an outstanding example of the special structures we can build to meet a wide variety of pressure, temperature and vacuum conditions at petroleum or chemical plants. Write our nearest office for full details.



## CHICAGO BRIDGE & IRON COMPANY

Atlanta 3	2107 Healey Bldg
Birmingham 1	1533 North Fifth St
Boston 10	1007-201 Devonshire St
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Cleveland 15	2212 Guilford Bldg
Detroit 26	1535 Lafayette Bldg
Houston 2	2151 National Standard Bldg
Los Angeles 17	1536 General Petroleum Bldg
New York 6	3314-165 Broadway Bldg
Philadelphia 3	1650-1700 Walnut St. Bldg
Salt Lake City 4	507 West 17th South St
San Francisco 4	1545-200 Bush St
Seattle 1	1307 Henry Bldg
Tulsa 3	1649 Hunt Bldg

When inquiring check CP 3325 on handy form, pgs. 2-3

**CHEMICAL PROCESSING**

# SLY

Pioneers and Leaders  
in INDUSTRIAL  
DUST CONTROL



4704  
Sly Dust Collector on  
roof at Pinkerton  
Tobacco Co. plant.  
Tobacco cleaning  
machines with dust  
pipes to Collector.

*Have You  
A Difficult Dust?*

## SLY CAN CORRECT IT

Tobacco dust is only one of the *difficult* dusts being collected by Sly Dust Filters. Others are powdered sugar, bentonite clay, paint and pigments, aspirin and other pharmaceuticals, chemicals of all kinds, talc, lime, detergents. Designed and engineered so that they save on space and power, Sly Dust Filters require less attention, less maintenance, yet — they are not expensive.

Sly Dust Filters are used to collect more than 100 kinds of dusts — and they get *all* the dust by filtration through cloth. Ask for Bulletin 98 and tell us your dust problem. Our experience with thousands of installations is at your disposal.



### THE W. W. SLY MANUFACTURING CO.

4754 Train Avenue • Cleveland 2, Ohio  
New York • Chicago • St. Louis • Philadelphia  
Minneapolis • Birmingham • Cincinnati  
Lansing • Los Angeles • Rochester • Toronto

When inquiring check CP 3326  
on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

signed by the American Cyanamid Company, Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. . . . or for more information check CP 3327 on handy form, pages 2 and 3.

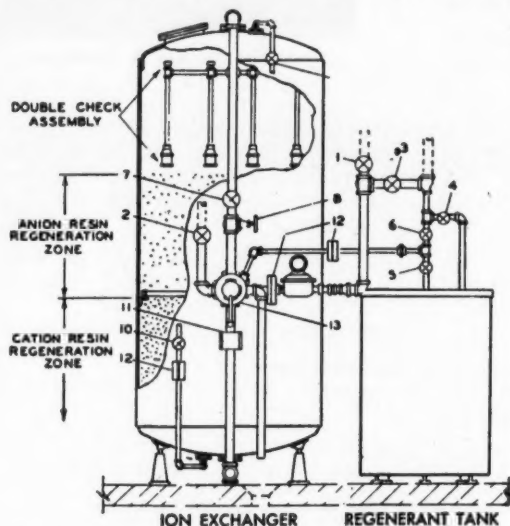
**Water of 5,000,000 ohms resistance  
being produced regularly by  
mono-bed deionizer . . .**

'double-check' manifold prevents loss of costly zeolite ion exchangers, permits deeper resin beds

**Uses:** Removes minerals, silica and CO<sub>2</sub> from water. Such water, after treatment, may be used as boiler feed, even for extremely high-pressure boilers, and in other processes requiring water of a very high quality.

**Features:** Specific resistance of the water delivered by deionizer is above 5,000,000 ohms. In fact, with careful control, water having a specific resistance of more than 23,000,000 ohms has been produced.

The "double-check" manifold arrangement guards against loss of zeolite during backwashing, and permits use of



Cutaway drawing of single tank deionizer with regenerant tank attached by piping

deeper zeolite beds for increased capacity. The deionizer has the other advantages of a mono-bed unit, such as lower investment cost, simple operation, uniform water quality even in intermittent service, lower space requirements, less regeneration time, and lower rinse requirements.

**Description:** The cation and anion exchangers intermixed in the deionizer (during the deionizing step) are resinous zeolite types. They have a marked difference in density which permits them to be divided by backwash into two zones for separate regeneration as illustrated. Each regenerant solution — dilute acid for the cation exchanger and a caustic solution for the anion exchanger — is introduced into its proper zone.

Thus, in this simplified equipment, water is deionized, the zeolite mixture separated into its components, the two resins regenerated, remixed and again returned to the deionizing cycle. These steps are accomplished by manipulation of a multiport valve and supplementary controls.

**Source:** Single tank deionizer is a product of Elgin Softener Corporation, Dept. CP, Elgin, Ill. . . . or for more information check CP 3328 on handy form, pages 2 and 3.



*features*

DESIGN SIMPLICITY  
OPERATING SIMPLICITY  
LOWEST COST  
EASY INSTALLATION  
STAINLESS STEEL  
CONSTRUCTION

**27 YEARS' EXPERIENCE  
IN SPRAY DRYING  
AVAILABLE TO HELP YOU**

**SOLVE YOUR SPRAY DRYING PROBLEMS.**

Bulletin Available On Request

*Engineered by*

**FOSTER D. SNELL, Inc.**

CHEMISTS • ENGINEERS

29 W. 15TH ST., NEW YORK 11, N.Y.

PHONE WATKINS 4-8800

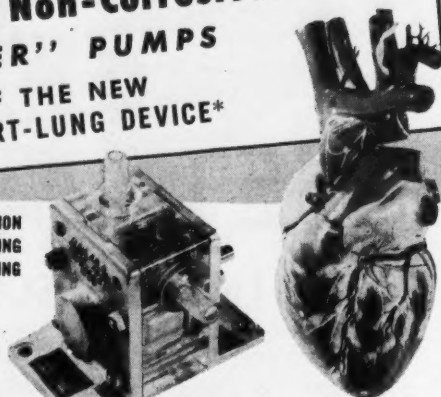
When inquiring check CP 3329 on handy form, pgs. 2-3

# VANTON Non-Corrosive "FLEX-I-LINER" PUMPS THE "HEART" OF THE NEW MECHANICAL HEART-LUNG DEVICE\*

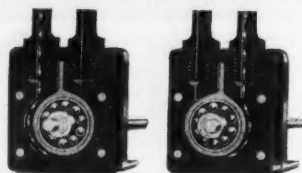
- CORROSION FREE • NO CONTAMINATION
- LOW MAINTENANCE • SELF LUBRICATING
- POSITIVE DISPLACEMENT • SELF PRIMING

Vanton Pumps are designed for handling a large group of acids such as hydrochloric, hydrofluoric, and sulfuric, alkalis, industrial alcohols, solvents, and many other corrosive liquids and gases. Liquid or gas pumped never touches metal—contacts only outer surface of "flex-i-liner", inner countersink surface of body block. 35 different combinations of rubber and plastic "flex-i-liners" and plastic pump body blocks to handle your pumping requirements. Used in leading plants throughout the country. Models from fractional to 5 G.P.M. Write for complete information.

\*Write for free reprint of New York Times story on the new Heart-Lung Device using the Vanton "Flex-i-liner" Pump.



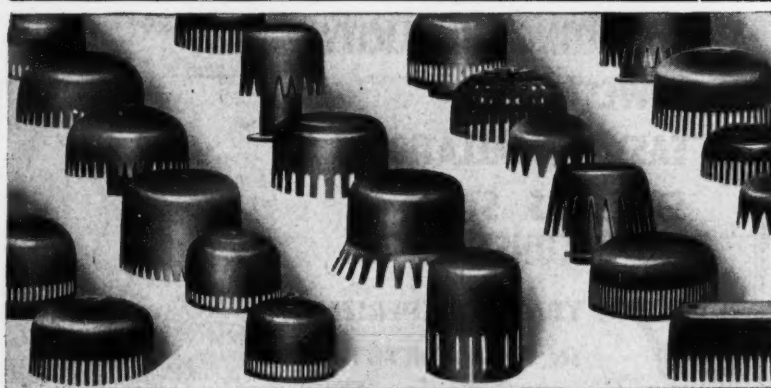
**Fluid Never Touches Metal**  
NO STUFFING BOXES • NO GASKETS • NO VALVES



## VANTON PUMP CORP.

Empire State Building, Dept. E, N.Y. 1, N.Y.

When inquiring check CP 3330 on handy form, pgs. 2-3



## SEND FOR PSC BUBBLE CAP BULLETIN 21

Largest Compilation of Engineering Data.

Lists 200 Styles Furnished Without Die Cost.

This standard reference contains complete specification information for over 200 standard styles of bubble caps and risers. Also drawings for use in determining methods of tray assembly. All styles list-

ed in Bulletin 21 are furnished promptly, without die cost, and in any alloy to meet your coking or corrosion problems. Special caps gladly designed; write as to your needs.

THE PRESSED STEEL CO., 709 N. Penna. Ave., Wilkes-Barre, Pa.



Custom Fabricators for the Process Industries Since 1928. Send Your Blue Prints

When inquiring check CP 3331 on handy form, pgs. 2-3

## PROCESSING EQUIPMENT

**450-gallon stainless steel tank  
feeds 12-spout automatic  
rotary filler . . .**

overhead drive facilitates cleaning under filler

**Uses:** For automatic filling of liquids.

**Features:** Rotary filler is fed from a 450-gallon stainless steel tank which can be located on the floor above. This tank can be removed for easy cleaning and sterilization. Cleaning under body of machine is facilitated by use of an overhead drive.

### Description:

Automatic filler with 12 spouts is being used in one application to fill 4-oz bottles with a semi-liquid preparation at the rate of 52/min. Greater speeds can be obtained by means of the variable speed drive. Sanitary fittings and spouts with no exposed threads are available. Machine is approved by New York City Board of Health and others.

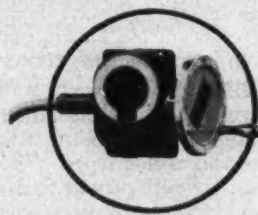
**Source:** MRM Company, Inc., Dept. CP, 191 Berry St., Brooklyn 11, N. Y. . . or for more information check CP 3332 on handy form, pages 2 and 3.

**Power drive manufacturer  
offers remote controls  
for his line . . .**

control is mechanical type, permits variable speed drives to be more adaptable in many applications

**Uses:** Mechanical remote control for maker's line of variable speed electric power drives. Unit extends applications of these drives in many circumstances.

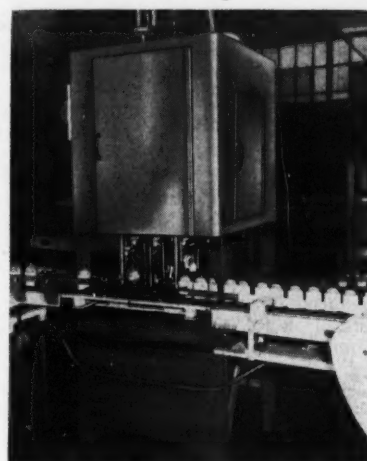
**Features:** Use of remote control affords wider use of



Remote control with extended flexible cable

the infinite variable speeds provided and a steady flow of power at any selected speed, even under fluctuating loads.

**Description:** Handwheel-type control is available in a variety of styles — with extended flexible cable, extended rod with universal joint, right angle bevel gear with

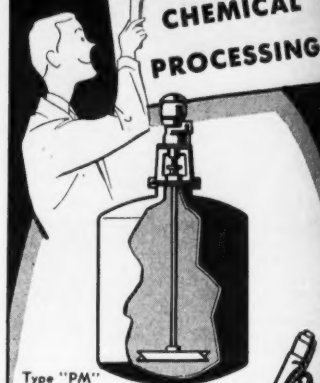


Feed tank for filler is located on floor above

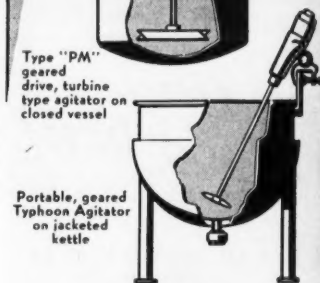
# Patterson

## AGITATING EQUIPMENT FOR

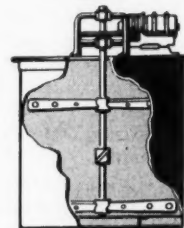
### CHEMICAL PROCESSING



Type "PM" geared drive, turbine type agitator on closed vessel



Portable, geared typhoon agitator on jacketed kettle



Vessel with Type "CGM" single motion drive and paddle type stirrer

PATTERSON can supply agitating and mixing equipment for the widest range of viscosities, in standard or special designs to provide any desired degree of agitation. *Send us your inquiries.*

*Robert L. Cameron*



**The Patterson Foundry and  
Machine Company**

East Liverpool, Ohio, U. S. A.

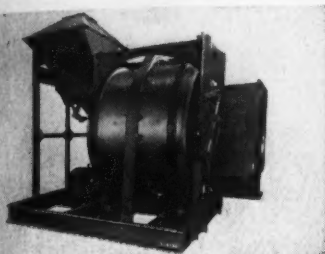
NEW YORK, BOSTON, PHILADELPHIA, PITTSBURGH,  
DETROIT, CINCINNATI, CHICAGO, ST. LOUIS, SPRINGFIELD,  
HOUSTON, LOS ANGELES, SAN FRANCISCO, SEATTLE  
The Patterson Foundry and  
Machine Company, (Canada) Limited  
Toronto, Canada  
MONTREAL

When inquiring check CP 3333 on handy form, pgs. 2-3

CHEMICAL PROCESSING

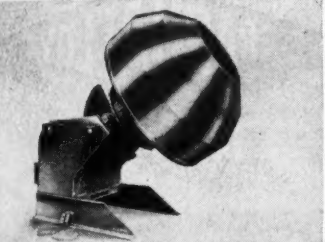
# The right mixer for top quality

Whatever your product, you'll find  
the one right mixer in the broad line of  
**WORTHINGTON-RANSOME  
INDUSTRIAL MIXERS**



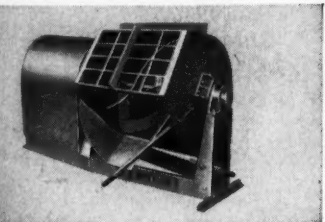
**HORIZONTAL DRUM.** For mixing refractory cements, soap powder, zinc furnace charges, linoleum compounds, dyes, glass batches, plastic powders, insulating cements, etc.

Sizes: 13 to 110 cu ft per batch



**ROTATING-TILTING PAN TYPE.** For mixing—and coating, coloring, tumbling, polishing and finishing drug tablets, candy, pills, dry gelatin, powdered milk, etc.

Sizes: up to 3000 lb per batch



**HORIZONTAL PADDLE MIXER.** Has revolving spiral paddles for mixing plastic cements, foundry sands, clay, etc. Drum tilts to discharge batch.

ALSO: several other types representing the outstanding line of mixers for the process industries, built from designs developed from nearly a century of mixer experience. Write for bulletin.

**WORTHINGTON**



WORTHINGTON PUMP AND MACHINERY CORP.  
RANSOME INDUSTRIAL MIXER DIVISION  
DUNNELLEN, NEW JERSEY YRO-3

When inquiring check CP 3334  
on handy form, pgs. 2-3

FEBRUARY, 1951

## PROCESSING EQUIPMENT

extended rod, chain and sprocket, or any combination of these. Remote speed indicator is also available.

**Source:** Mechanical remote controls for Speed-Trol electric power drives is made by Sterling Electric Motors, Inc., Dept. CP, Los Angeles 22, Calif. . . or for more information check CP 3335 on handy form, pages 2 and 3.

### Shredding is profitable way to dispose of waste paper, get packing material . . .

safe, fast units deliver clean, shredded papers ready for use; also shred felt, rubber, etc.

**Uses:** Converts wastepaper, newspapers, discarded letters and office records into shredded form for use in product protection during shipment. Also shreds kraft, cellophane, labels, foil as well as such non-paper products as felt, leather and rubber.

**Features:** Simple and safe to operate. No dust, litter, splinters or noise. Easy to maintain. Seals prevent any oil leakage. Blades retain sharpness. Resharpener is needed only once in two years when machine is subjected to average service. Old records and papers are disposed of profitably.

**Description:** Built in three series: No's 1,000, 2,000 and 3,000. The first is a heavy duty production unit,



Series 2,000 table model paper shredder

having a 21" cutting width. It has a 3 hp reversible type motor with overheating controls. Capacity is 1,000 lb per hr.

Series 2,000 has a cutting width of 14" and is equipped with a 1 1/4 hp motor (or a 1 hp motor). It has a capacity of 400 lb per hour. Cuts paper into 1/16" shreds and multiples. This unit is shown in illustration. Series 3,000 has a 9" cutting width and operates from a 1/8 hp motor. It is a small table model, generally resembles Series 2,000, but is greatly reduced in size.

All units deliver shredded material clean and dust free, ready for use in protective packing. Table models are compact, easily handled. Large models are equipped with heavy duty swivel casters.

**Source:** The Shredmaster Corp., Dept. CP, 205 Wiloughby Ave., Brooklyn 5, N. Y. . . or for more information check CP 3336 on handy form, pages 2 and 3.

**dustube**

*improves working conditions . . .  
increases efficiency AT FERTILIZER PLANT*

through low cost  
dust control

When Sunland Industries, Inc., in planning their new plant in Fresno, California, were faced with a major dust problem, they consulted

AMERICAN Engineers. A complete dust control system was designed and installed that thoroughly and economically removes the dust nuisance.

Specially designed ventilating hoods and piping completely remove all dust at its source. The entire system is so efficient that operating and maintenance costs are kept to a very minimum.

Approximately 20 cu. ft. of dust are salvaged every 40 hour week. However, these savings, profitable as they are, are over-shadowed by the advantages gained through improved working-conditions and greater production efficiency.

Why not call upon this valuable experience to help you with your dust-control problems? AMERICAN Engineers will gladly consult with you at any time without obligation.

Write today for complete information.



**American**

OFFICES IN PRINCIPAL CITIES

**dustube**  
COLLECTORS

AMERICAN WHEELABRATOR & EQUIPMENT CORP., 478 S. Byrkit St., Mishawaka 12, Ind.

When inquiring check CP 3337 on handy form, pgs. 2-3

## Durametallic Packing Wins Test Sealing 18 Solvents and Diluents

One of the nation's leading valve manufacturers recently conducted a thorough test on the corrosion resistant qualities of three leading brands of packing.

18 solvents and diluents were used in the test as follows: Butyl Acetate, Butyl Cellosolve, Cellosolve, Ethyl Acetate, Bensol Naphtha Med. Boil., Naphtha High Boil., Solvesso No. 2, Toluene, Xylol, Amyl Alcohol, Butyl Alcohol, Ethyl Alcohol, Isopropyl Alcohol, Methanol, Acetone, Methyl Ethyl Ketone and Methyl Isobutyl Ketone.

The packing that proved successful on this 90-day test, (having no leak or corrosion affecting operation), is indicated by the test engineer's report: "A valve suitable for handling solvents, diluents, paint and lacquer thinner should have the following stem packing—DURAMETALLIC NO. 777 NMT."

We will be glad to forward information on this or other types of Durametallic Packings for valve and pump requirements . . . simply write to the Durametallic Corporation, Kalamazoo, Michigan, for Bulletin No. CP-438.

When inquiring check CP 3338 on handy form, pgs. 2-3

## Announcing ASCO "MIDGET" SIZE TWO-WAY AND THREE-WAY SOLENOID VALVES

### Only 2 $\frac{13}{16}$ " From Finger to Thumb

These Midget Two-Way (illustrated) and Three-Way Valves have many applications in the control field because of their compactness, sturdiness and efficiency. The Two-Way Valve comes in two pipe sizes:  $\frac{1}{8}$ " and  $\frac{1}{4}$ " Normally Closed (closed when de-energized) and  $\frac{1}{8}$ " Normally Open (open when de-energized). The Three-Way Valve comes in one pipe size only:  $\frac{1}{8}$ ". Both are standard in brass or stainless steel. Permissible pressures: Two-Way Valves up to 300 lbs./sq. in. (AC) and up to 250 lbs./sq. in. (DC); Three-Way Valves up to 125 lbs./sq. in. (AC) and up to 50 lbs./sq. in. (DC). Adjustable Main Flow and By-Pass Flow available for Two-Way Valves. Twenty-four inch (24") leads. The Three-Way Valve is only slightly larger than the Two-Way Valve illustrated. It is only 3-5/16" from top to bottom. Twenty-Four inch (24") leads.

If you have been looking for a really small and really efficient solenoid valve, one of these two ASCO Midget Valves may be just what you need. We'll be glad to send you complete information (Bulletins 8262 and 8314) but in writing will you tell us something about your requirements?

These valves will be exhibited in Booth 550-551 at the New York Power Show, November 27th to December 2nd.

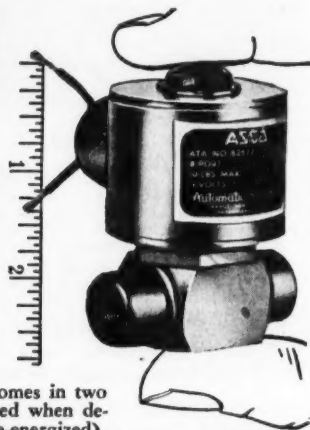
When in need of Automatic Transfer Switches, Remote Control Switches, Contactors, Relays, and Specialized Electromagnetic Controls, come to us.



## Automatic Switch Co.

379 LAKESIDE AVENUE • ORANGE, NEW JERSEY

When inquiring check CP 3339 on handy form, pgs. 2-3



## PROCESSING EQUIPMENT

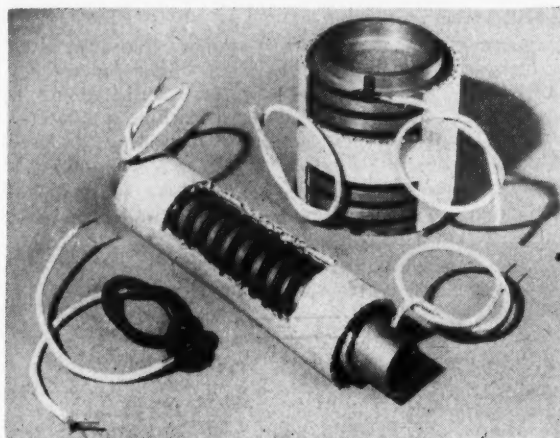
**Heat liquids, plastics and gases  
by attaching electric units  
to pipes or containers . . .**

refractory insulation permits heaters to operate at temperatures approaching 1000°F

**Uses:** Can be applied to pipes, valves, cylinders and containers carrying viscous or free-flowing liquids, plastic compounds or gases.

**Features:** Units combine extreme flexibility and strength with minimum bending radius of  $\frac{1}{2}$ ". Due to refractory insulation, they can operate at temperatures approaching 1000°F for long periods.

**Description:** Units are sheathed in 5/16" diameter spring steel. Standard units are offered in lengths of 1' to 10', in 1' increments, for 115 or 220 volts. Three



Flexible heating units have minimum bending radius of  $\frac{1}{2}$ "

types are available: 5 watts per lineal inch, giving a sheath temperature of 475°F in free air; 10 watts, 650°F; and 15 watts, 700°F. Other types, with higher temperatures and longer lengths, are made to specifications.

**Source:** Serpentine flexible electric heating units are made by Titan Mfg. Co., Inc., Dept. CP, 290 Terrace, Buffalo 2, N. Y. . . . or for more information check CP 3340 on handy form, pages 2 and 3.

### Effects continuous removal of solids from slurries

Operating principles and applications for 2 types of high speed horizontal centrifuges that continuously remove solids from slurries and suspensions are fully explained in 10-page, 2-color bulletin. Operation of both types is based on use of centrifugal force for separation, in combination with an internal screw conveyor for continuous removal of solids.

Bulletin is designed to permit direct comparison of construction and function of both centrifuges, one equipped with conical rotating bowl for handling firm-bodied or crystalline solids, the other with cylindrical bowl for handling relatively soft or plastic solids.

In addition to cutaway drawings, bulletin includes complete information on features and specifications as well as installation shots and a summary of applications in the chemical industry. Bulletin 1254 is issued by The Sharples Corporation, Dept. CP, 2300 Westmoreland St., Philadelphia 40, Pa. When inquiring specify CP 3341 on handy form, pages 2 and 3.

WORKS WHERE OTHERS WON'T

for  
**SUBMERGED  
OILLESS  
BEARINGS**



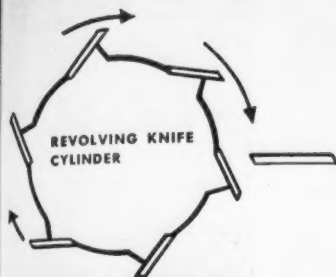
- OPERATE DRY or SUBMERGED IN DYES, PLATING, CLEANING & CHEMICAL SOLUTIONS, GASOLINE, FOODSTUFFS
- TRULY OILLESS AND SELF-LUBRICATING
- EXTREMELY DURABLE
- CONSTANT COEFFICIENT OF FRICTION
- APPLICABLE OVER A WIDE TEMPERATURE RANGE—even where oil solidifies or carbonizes
- EXTENSIVELY USED IN CONVEYORS, PUMPS & OVENS
- ROTATING SEALS OF GRAPHALLOY ARE UNEXCELLED

## GRAPHITE METALLIZING CORPORATION

1004 NEPPERHAN AVENUE, YONKERS 3, NEW YORK

When inquiring check CP 3342 on handy form, pgs. 2-3

CHEMICAL PROCESSING



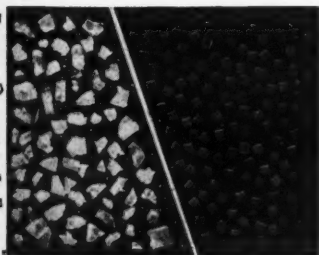
# CUT!

**IT'S BETTER  
THAN  
GRINDING**

Uniformity of size and shape of plastic stock is of greatest importance in molding. Uniform stock means more uniform molded products. Machines that tear or cut materials irregularly do not produce the particles of the uniform size and shape that are so desirable. Instead they leave fines and a wide variation of particle sizes and shapes leading to defective molding.

Taylor-Stiles cutters cut plastic stock into particles of uniform size, without fines, and in exact shapes at high production speeds.

We also manufacture Taylor-Stiles cutters to produce filler and binder materials, as well as a full line of other precision and production cutters.



Samples of Pelleted Plastics  
(Left) From Screen Grinder  
(Right) From Our Dicing Cutter

Write today for illustrated literature—no obligation.

**TAYLOR-STILES & CO.**  
20 Bridge Street Riegelsville, N. J.

When inquiring check CP 3343  
on handy form, pgs. 2-3

FEBRUARY, 1951

## Convention & Exhibit Schedule

Feb. 28-Mar. 2. SPI Reinforced Plastics Division Meeting (6th Annual Technical Session), The Society of The Plastics Industry, Edgewater Beach Hotel, Chicago.

Mar. 5-7. Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, William Penn Hotel, Pittsburgh.

Mar. 11-14. American Institute of Chemical Engineers (Regional), White Sulphur Springs, W. Va.

Mar. 13-16. National Association of Corrosion Engineers (Annual Conference and Exhibition), Hotel Statler, New York.

April 1-5. American Chemical Society (119th National Meeting, divided), Boston.

April 3-6. 21st Annual Safety Convention & Exposition, Hotel Statler, New York.

April 8-12. American Chemical Society (119th National Meeting, divided), Cleveland.

April 16-18. American Society of Lubrication Engineers, Bellevue Stratford Hotel, Philadelphia.

April 30-May 4. Fourth National Materials Handling Exposition, International Amphitheatre, Chicago.

May 7-11. Greater New York Industrial Show, 71st Regiment Armory, 34th Street and Park Avenue, New York.

May 11-14. American Institute of Chemical Engineers (Regional), French Lick, Indiana.

May 13-16. American Institute of Chemical Engineers (Regional), Kansas City, Missouri.

May 23-24. The American Society for Quality Control (Annual Convention), Cleveland.

May 24-25. SPI Annual National Meeting, The Society of The Plastics Industry, Greenbrier Hotel, White Sulphur Springs, West Virginia.

Sept. 10-14. Instrument Society of America, Coliseum, Houston, Texas.

Sept. 16-19. American Institute of Chemical Engineers (Regional), Rochester, New York.

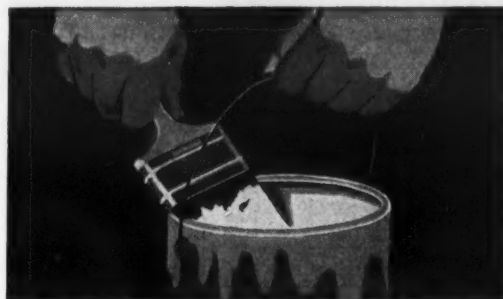
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Containing complete and thorough specifications, 28-page catalog section describes and illustrates line of hydraulic cylinders designed for operating pressures to 1500 psi. Contents include information on mountings, accessories, parts, installations, and special models. Catalog 200, Section 2, is issued by Logansport Machine Co., Inc., Dept. CP, Logansport, Ind. When inquiring specify CP 3344 on handy form, pages 2 and 3.

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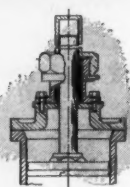
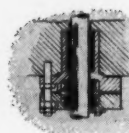
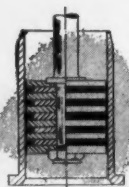
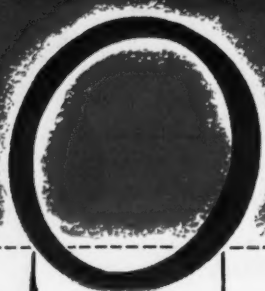
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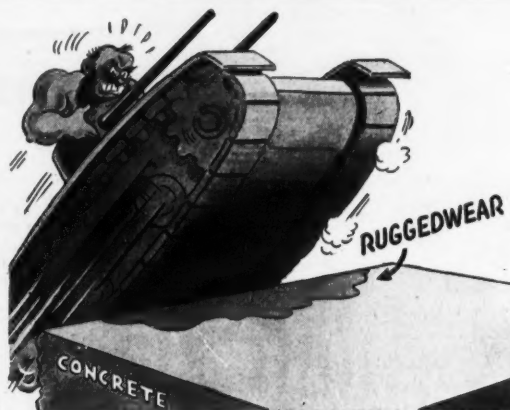
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### "That's Interesting"

#### Stainless steel shells for nitric acid tanks

Phillips Chemical Co. is producing 154,000 tons of anhydrous ammonia per year from natural gas and air. New construction at the plant includes a unit to make nitric acid by oxidizing ammonia. There is also a plant to make 100,000 tons of fertilizer from ammonia.

The nitric acid produced in the nitric acid unit is used to manufacture ammonium nitrate by neutralizing it with ammonia. It has an acid strength of about 60% and, due to its corrosive nature, is pumped from the acid plant into two feed tanks at the ammonium nitrate plant through a stainless steel pipe line.

This former ordinance plant at Etter, Texas, was leased from the government in 1948 and has been enlarged and remodeled.

The two feed tanks, which are 20' in diameter by 20' high, are built of relatively light gauge stainless steel plates (Type 347 Cr-Ni, columbium-treated) with a carbon steel structural framing supporting them.

#### Ozone bulb

A small electric bulb is now being made which operates on house current and gives off small amounts of ozone. The lamp may be used in refrigerators and sanitary storage cabinets. (The Agitator—Noble & Wood Machine Co., Hoosick Falls, N. Y.)

#### Recovering mercury from mine dumps

Mine dumps at mercury deposits, in three southwestern Arkansas counties, are estimated to contain about 36,000 lb of recoverable mercury, based on investigation of the state's cinnabar deposits. Cinnabar is the principal ore mineral of mercury and is found in only a few states in the country.

In 1942, peak production of the area amounted to 2,392 flasks or 181,792 lb. A copy of Report of Investigations 4737, "Investigation of Southwestern Arkansas Mercury District, Howard, Pike and Clark Counties, Ark." is available from Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa.

#### Improved refrigerant fluid

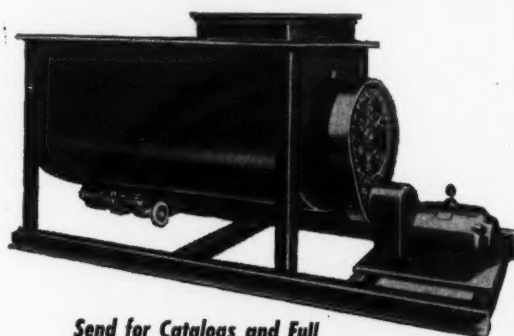
An improved fluid for use in refrigeration and air conditioning systems has been granted patent 2,511,993. The inventor is Winston Harrison Reed of Syracuse, N. Y., assignor to Carrier Corp., Syracuse, N. Y.

It is an azeotropic mixture of propane and monochlorodifluoromethane. It will meet refrigeration capacity and horsepower requirements of 17 to 18% more than Freon-12 for a given compressor displacement, it is claimed. (As reported in Aminco Lab News, American Instrument Co., Inc., Silver Spring, Md.)

For more information on product advertised at right, specify CP 3351 . . . see information request blank between pages 2-3.

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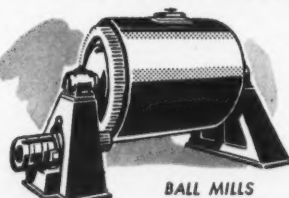
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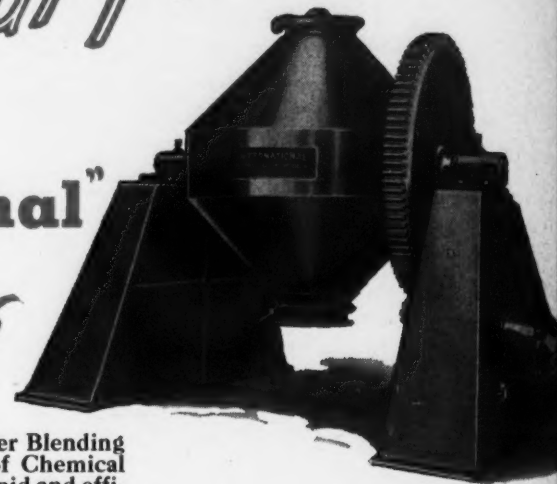
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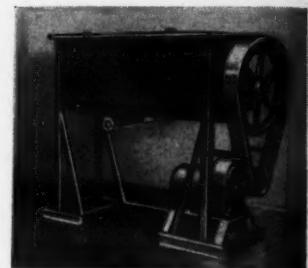
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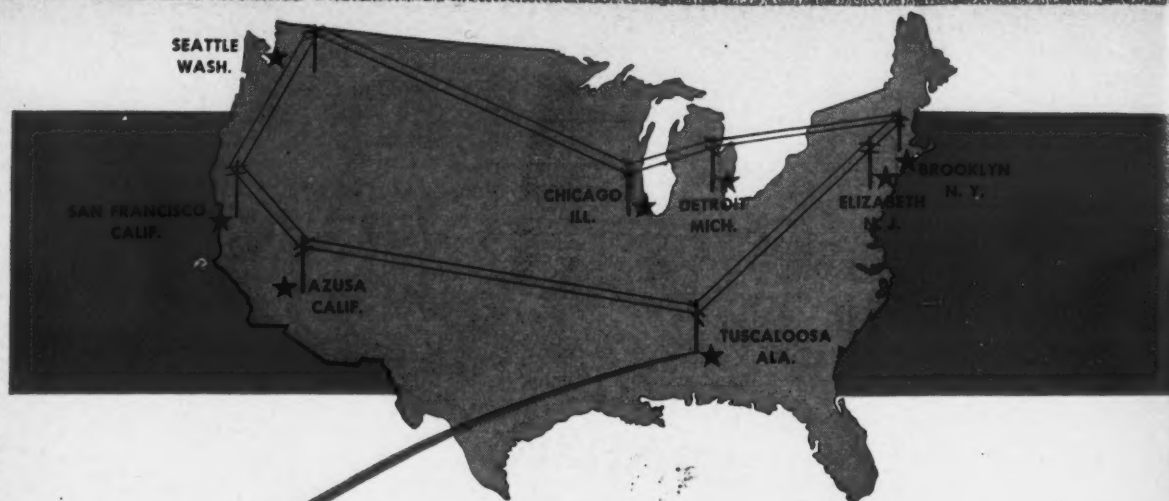


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For more information on product advertised at right, specify CP 3352 . . . see information request blank between pages 2-3. ➡

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